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LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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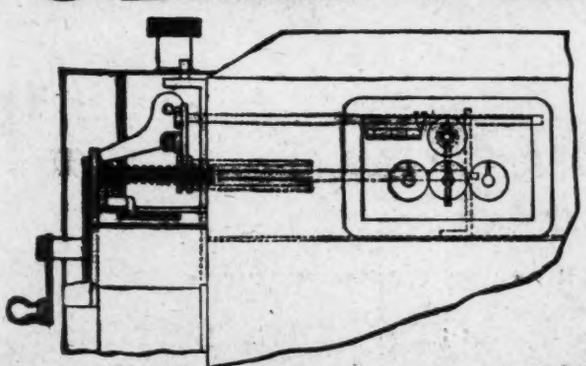

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VOL. CXLII., No. 2866.] TUESDAY, APRIL 16, 1918. [70TH YEAR.

EDITORIAL NOTES.

The Gas Bills Deferred.

THERE are some share and stock holders in gas companies who have been hoping that, by the time they meet in August, or by the time the interim dividend is declared if meetings are annual, their Directors would have been put by Parliament in a position to give them some relief from the grievous case into which war circumstances have forced them. They may at once send adrift any such notion; for it is not by any means likely to be realized. The adjourned debate on the motion for the second reading of the Bills which seek relief, and the plan of the Board of Trade that a Select Committee be appointed to consider the proposals of the measures, was to have been resumed on Wednesday last; but the Man Power Bill and the military position were the all-absorbing topics in the House. Then it was announced that the adjourned debate would be taken on Thursday. But when that day came, Sir Donald Maclean, the Deputy-Chairman of Committees, moved that the Bills be adjourned to Thursday, May 9, "in view of the intention "of the Board of Trade to ask for the appointment of a "Select Committee to consider the question at issue on all "the Gas Bills." On the face, we cannot see the relevancy of the reason for the postponement of the debate. Perhaps there is some explanation; but even the military situation does not appear to necessitate the deferring of the appointmeet of a Select Committee for a whole month to consider and to adjudicate upon a matter which need not in any way interfere with the national work of the House. However, there it is; and apparently another month is to be lost. If it is absolutely necessary, we will not complain; but if it is not necessary, then we think that an appeal to Parliament for common justice might be dealt with in a somewhat more expeditious manner.

Fuel Oils from Gas-Works.

FUEL oils from gas-works have been receiving considerable publicity during the past week. There appears now to be a greater amount of anxiety over the provision of additional quantities of such oils than over the supply of benzol and toluol. If the country was not well secured in regard to the latter, the Ministry of Munitions would not allow, as is now the case, tar-wells to be overflowing and tar dehydrating plants to be standing idle. These conditions were the subject of plaint at the meeting of the Midland Association on Thursday. The position is largely attributable to the fact that the Road Board have almost completely shut-off the outlet that road surfacing and road repair afforded for dehydrated tar; and gas-works have not enough storage for both crude tar and dehydrated tar, to the former of which day-by-day contribution is made. Of course, the day will arrive when the idle plants will come into their own again for profitable working; and one never knows how soon the owners will be instructed to put the plants into commission once more, in order to supplement the stocks of high explosives, which are being eaten into by the heavy expenditure and losses at the front. But precedent to any such order must be provision for the disposal of the dehydrated tar. However, until the Ministry of Munitions says that there can be relaxation from the high volume standard of recovery that has been attained, nothing should be done, unless it is positively unavoidable, that will detract from the quantity of the output. But, at the same time, it is for the Ministry to see if there is not some way out of the *impasse* in which unfortunately many gas undertakings at present find themselves in regard to tar.

But while there were these complaints at the Midland meeting, those present appear—at any rate, omission to refer to the subject leads to the conclusion—to have wholly overlooked the offer of a prize by the Government of £2000 [*ante*, p. 49] for the production of a new fuel oil, which will answer the broad requirements of the Admiralty specification; and the fuel oil wanted is one which should, if the terms are of a nature that research can successfully meet, give another outlet for dehydrated tars. The £2000 is substantial evidence that what the Government require is not something that has been accomplished or can be done without chemical investigation, which indicates the recognition of difficulties in the way. They want a fuel oil produced by admixture of dehydrated coal tar with mineral petroleum oils. The offer desires to ensure little waste of the original dehydrated tar; for it provides that the process shall be such that it will utilize at least 95 p.ct. of the original dehydrated tar. And while the highest proportion of dehydrated tar possible in the mixture will be preferred, no mixture will be regarded as satisfactory that contains less than 33 p.ct. of dehydrated tar. The problem is not a simple one; but the offer shows an appreciation on the part of the Government authorities that the supply of dehydrated tar in the country is plentiful, while their other fuel oil resources are distant, and subject to all sorts of dangers. The percentages suggested have no doubt been well-considered before publishing the offer. But perhaps a modification of the 95 p.ct. might assist in lessening the difficulty of the problem which the Government have set investigators into such matters to solve.

The gas industry could give the Government a considerably greater amount of fuel oils, if the different Government Departments—coal, labour, and munitions—would only put their heads together, and make the necessary arrangements. But they do not do this; and the result is not satisfactory. As "Cricket" was pointing out in last week's "Correspond-"ence" columns, if only railway wagons were used to carry coal to gas-works and for a few months not to domestic grates, the gas industry could, within the limits of works capacity and man power, supply a much increased quantity of everything the Government need from coal. But while one department is urging the increased production of (say) liquid fuel, another is curtailing the power of compliance. In this connection, the various systems of continuous vertical retorts are going to take a large part in fortifying the home production of liquid fuels. A conference called by Sir Arthur Churchman, Controller of Mineral Oil Production, was held in Manchester last Friday; and information was given which shows that, by the application of suitable temperatures and regulated steaming, the production of liquid fuels can be considerably augmented, without detriment to the volume of gas supply per ton of coal, and in fact with an increase of both gas and sulphate of ammonia. A great deal of work has been carried out in this connection by Mr. John West and other investigators. One thing was made abundantly clear at the meeting; and it is that cannel will not play such an important part as coal in this matter of supplementing liquid fuel supplies, in view of the fact that the former is less available at present than the latter. It is much a case of Hobson's choice. But the work that has been done is indicative of two things—that the owners of continuous vertical retorts can greatly help the Government, and that before long professional gas men will, when contemplating the erection of new carbonizing plant, take into account, as a very proper factor for consideration in company with gas make and other things, the relative capability of plants for producing liquid fuel and motor spirit. The composite character of the gas industry's business is extend-ing, which is a positive advantage to permanent stability.

The Drain on Man Power.

The two matters that have been occupying chief place in national thought during the past week have been the critical military position, and the further call upon the reservoirs of our man power—not that some of these reservoirs have any surplusage without sending many an industry further along the road to temporary ruin. But the military position is a compelling force; and further sacrifices have to be made. In its vital parts, the gas industry will not be immediately affected by the proposals of either the Military Service Bill or the order issued by the Director-General of National Service, which cancels a large number of occupational exemptions from military service granted by the tribunals. The extension of compulsory military service to Ireland will give the gas engineers and managers there an opportunity of showing as much grit as their English, Scotch, and Welsh *confrères* have done by parting with men, and by working with a vastly reduced number. The Bill raises the age of military service to 51 years, and by Order in Council the limit can be extended to 56. Sweeping powers are also taken for dealing with exemption certificates, which may be withdrawn by proclamation. While by the Bill—the same applies to the new order as to the cancellation of a large number of occupational exemptions—protected occupations are not affected, the new call upon man power will in all probability put some further pressure upon the gas industry through the additional screening of the clerical department, and through the further comb-out that is to be made in the coal, engineering, and fire-clay industries, by the cancelling of exemptions. Engineering fitters and erectors, and some others specified, born in or after the years named in the new National Service Order (which should be on sale at the bookstalls and at the Government publishers this week), will be taken; and though among fire-clay workers those making chemical ware and firebricks are not to be touched, the further thinning-out must affect work generally in such an industry. This cannot be helped; but it all contributes to reducing the value of priority certificates to mere "scraps "of paper" for material and labour required for renewals and repairs. Extensions, unless for direct war work, are altogether out of the question. To put the matter shortly, though the gas industry is largely protected, it is not going to escape scath entirely under the new proposals. Beyond this, there are the uncertainties as to the future. Happy will those gas managers be in view of the position to-day who have already taken steps to fortify themselves by training further woman power for employment in fresh spheres. Upon the wisdom of this course, we insisted at the time a description was given in the "Journal" of what is being done in the Vauxhall retort-houses of the South Metropolitan Gas Company.

Standard Gas and the Relations of the Gas and Electricity Industries.

We thank (as did the members of the Midland Association last Thursday) Mr. W. Chaney for his thoughtful Presidential Address to that body. It dealt with certain polemical subjects of grave importance to both the gas and electricity industries, which affect their reconstruction problems and their economic situations and relations. In the interests of the one industry as of the other, it is desirable that nothing should be done hastily, though no time should be lost in making satisfactory exploration. It depends much upon the lines on which high authority permits (probably through the results of the report of the Board of Fuel Research) the gas industry to develop, how and to what degree the fortunes of the two industries can be linked-up—the one as the provider of fuel for the generation of electricity by the other. The development of the two industries, as a matter of fact, is one and not two questions—when regarded as a national matter, which is the correct point of view.

The ability of the gas industry to serve the country will be controlled by the attitude of Parliament in allowing it the liberty to provide gas which shall have a range of service that has not hitherto been attempted, though advocated by men of advanced thought and penetrative power, who have foreseen requirement and a land of promise for a combustible gas occupying a position in a different category from both producer gas and the old character of town gas, which latter has been made to comply with standards that have fallen short of ensuring the description of gas that is now needed. In this connection, we are glad to hear at least one voice from Birmingham enunciating views that square more with progress in the matter of the constitution of gas than does adherence to high standards of gas that ignore the flow of knowledge as to gas combustion and demand, though nowhere more than in Birmingham should these paramount influences have directed opinions into new channels.

"The use of gas to-day," says Mr. Chaney, "demands a "gas of good combustible qualities, capable of yielding high "temperatures, and rendering the best service to the con-"sumer at the lowest cost." Let us take our stand upon that as the most acceptable doctrine in the gas industry to-day—a doctrine the truth of which was only dawning upon the technical minds of the industry at the time of the outbreak of war, but one which has obtained a high place in acceptance since the "Journal" first drew attention to the dangerous position into which the gas industry was drifting through the mischievous practices of a number of gas undertakings, and at the same time revived the question of the utilization of blue water gas as an excellent combustible diluent for assisting to ameliorate wartime difficulties. There need not be any disputation over the subject of avoidable inerts in gas made and distributed for domestic, industrial, and public purposes. Gas-works plant and distribution efficiency do not require the presence of avoidable inert constituents, nor do the numerous appliances in the households and factories of the country. Apart from the fact that it is the business of the gas industry to sell combustible gas free from all but unavoidable inerts, it is often overlooked that calorific power and inerts have a very close relationship. Remarks Mr. Chaney: "Gas of low calorific value is much "more easily controlled by the fact that the air required for "combustion approaches more nearly the volume of gas con-"sumed." It therefore follows that the lower the percentage of incombustibles in the gas can be practically brought, and the lower the amount of air required for combustion, the better for flame temperature and the ordinary purposes of gas use.

We must not, however, allow our good conceptions of requirements to be vitiated by experiences with incompatibles. Mr. Chaney would no doubt be sorry if anything he said in his address led to the view that he was wavering between two opinions. He laid it down, as we have seen, that "the use of gas to-day demands a gas of good combustible "qualities." But later on we read: "Much has been "written and said concerning inert gases; but it must be "borne in mind that with gas containing exceedingly high "percentages of inert gases, such as producer gas, very high "temperatures are obtained." Of this, sight has not been lost. Later on, again, the President remarks: "The heat-"ing of a carbonizing plant by means of producer gas is a "typical instance of the use of gas of low calorific value "for maintaining high temperatures. The average calorific "value of the gas is 125 B.Th.U. per cubic foot, and a "temperature of 1250° C. is regularly maintained." This again is a useful piece of evidence. But in regard to the first quoted passage rather than the second, the refinements required by domestic gas appliances and the conditions of the heating of carbonizing plant have differences as wide asunder as the poles; and from the fact that producer gas containing large percentages of inerts (which do not *per se* contribute to high temperatures) is capable, under certain conditions of use, of promoting high temperatures, it cannot safely be deduced that, under other conditions, the same high temperatures would be realizable, even if town distribution of such gas was admissible or its use practicable in domestic appliances. The reference to producer gas does not in any way depreciate the arguments advanced against the presence of inerts in town gas; it only shows that, under the conditions of use—with bulk supply of low-grade gas, plentiful combustion space, air supply, and liberal outlets for the products of combustion—high temperatures can be obtained with gas containing a very large percentage of inerts. But the conditions of use are not those of town gas. However, given the right to make and distribute the combustible gas now required, it would open the way to the standardization of suitable plant for the production of the gas, and to suitable appliances for its use.

In the address, we come across the old argument as to the impossibility of making from coal 12,500 c.ft. of 500 B.Th.U. gas without adding any inert gases from outside. There is little reason in reopening this question to-day, in view of the use of blue water gas or steaming, the former of which Mr. Chaney describes as both "an economical "and a convenient means" of maintaining a regular and

consistent supply of gas. But there is a companion picture supplied by the inerts question. The President says that if the inert gases were to be restricted—he does not believe in further restriction—to (say) 15 p.ct., the make of gas would probably not exceed 11,500 c.ft. per ton, while the calorific value could not be reduced to the 500 B.Th.U. standard. There, again, this all depends upon conditions. The South Metropolitan Company have, even during war time, made as the average on a half-year's working 12,250 c.ft. per ton of gas which is maintained with an inerts content of, approximately, 12 p.ct.—10 p.ct. of nitrogen and 2 p.ct. of carbonic acid and oxygen. Vertical retort-working, with and without steaming, has shown figures which demand for Mr. Chaney's statements some qualification; and Mr. Yuill only last week was pointing out that the minimum of 12½ p.ct. that has been advocated could well be reduced by one-half with vertical retorts and the use of superheated steam. The correctness of the statements are controlled by conditions; and we have to arrange for the conditions, as opportunity is granted, that will best comply with requirement.

Liberty in the production of a suitable combustible gas has following upon it considerable possibilities; and among them the linking-up of the gas and electricity industries in business relations. Mr. Chaney takes his experiences at Saltley with the coke-oven plant, with the use of coke breeze for raising steam for generating electricity for driving the carbonizing plant, and with the utilization of the gas from producers for heating the carbonizing plant, to show how there could be interconnection with mutual economy between the two industries. We commend this part of the address to our readers who are of the electrical profession. They will find it suggestive of consideration in relation to the live topic of how they can share in both conserving and making the best use of the nation's coal resources.

The address is one that is of good value in these times, when fresh history is being made by the industry. There are some thinkers and workers in the industry who do not come out upon the stage of affairs until they are drawn in some way. For this reason, we are glad Mr. Chaney has just at the present time been placed in the Presidential Chair of the Midland Association.

The Five-Sixths Ration.

According to a statement that appeared in the newspapers last week, the Board of Trade intend—however difficult their rationing regulations may be to gas and electricity consumers, however much consumers may be up in the clouds as to how they are to judge whether they are with passing time keeping within the prescribed limits, and however much they have previously economized to the destruction of every vestige of a margin—to carry out very strictly the new regulations. All gas and electricity undertakings in the area concerned are to report to the Board of Trade any person whose consumption appears to exceed that allowed by the Order. Explanations will, of course, be permitted. But it is intended that the scourge administered for disobedience shall be an effective one. In the case of prosecutions, the proceedings will be considered as summary offences against the Defence of the Realm Act; and the fine may be anything up to £100, or six months' imprisonment. The six months' imprisonment would relieve a good many gas and electricity consumers of much anxiety during the period. Since this terrible threat appeared, it has been somewhat toned-down by a paragraph in the daily papers which reads: "Sir Albert Stanley says that, if a person who has used an apparently excessive amount of gas or electric current can give a satisfactory explanation to the Board of Trade, no proceedings will be taken. But the necessity for a general reduction of consumption is pressing."

Coal and Gas Rationing.

There is not much difference between the views expressed on this subject by Mr. Phillip G. G. Moon and ourselves. He is not (as his letter in our "Correspondence" columns indicates) a sympathizer with the idea that the displacement of the gas and electricity rationing scheme could be secured by rationing coal supplies to gas-works. Of course, this point was put forward on the assumption of the impossibility, for the time being, of getting sufficient railway rolling stock to compensate for the removal of the means of bringing coal southwards by the sea. But as our article last week showed, we do not consider that the Coal Controller has exhausted all possible sources of reduction of southern coal consumption, nor is he, in present circumstances, doing the best possible to help himself, and at the same time the Ministry of Munitions, the Admiralty, and the Board of Agriculture, by not rigorously cutting-down household coal consumption, and insisting upon the use of coke and gas up to the maximum practicable employment of the resources of gas undertakings, some of which are not wholly dependent upon coal as their gas manufacturing material. Of course, to keep these resources fully occupied, subject to local gas demand, would necessitate the supply of coal to the extent required. But assuming a continued shortage of coal after the proposed drastic household coal rationing, and utilizing to the full the resources of gas undertakings as fuel suppliers, then without a coal-rationing scheme be applied to public utility undertakings, the unfortunate concerns mentioned in No. 4 of Mr. Moon's suggestions might suffer to the advantage of their fortunate contemporaries mentioned in No. 3. However, we hope that the conditions will so mend—though admitting the shallowness of the foundation for such a hope—that the assumption will never become an actuality. Subject to these comments, Mr. Moon's suggestions have our hearty concurrence.

Coal Supplies

The gas industry is in a perfect quandary over the various requirements of the Government Departments. While some of these are urging gas undertakings to increase this or that production, others are vigorously curtailing their power of doing so. More liquid fuel is required, and more sulphate of ammonia; but in a large part of the country, supplies of coal are scarce, and a considerable reduction follows the deprivation of sea transport. Some works that have hitherto been dependent upon seaborne coal have not had any supplies for best part of a month, and railway wagons are not yet available for their service. Stocks reduced by the winter's requirements are being further eaten into; and unless there is a rapid change, coal starvation is not far ahead—despite the anxious perseverance of the managers to reinforce their position. The Ministry of Munitions, the Admiralty, and the Board of Agriculture are greatly concerned in this matter; and they should bring their influence to bear upon the Coal Controller and the Railway Executive to see that gas-works obtain preferential treatment. We saw the other week the cellars of Government buildings being charged heavily with coal. It is time this matter of coal supply was looked at from the point of view of the industry rendering the largest all-round service to the nation. But that there is no intention it shall be at present, is clear from the reply given by the President of the Board of Trade to the Right Hon. Sir Daniel F. Goddard in the House last week. Sir Albert Stanley then intimated that the supply of coal to gas and electricity undertakings would, for the reasons he has already explained, be considerably curtailed.

And Sulphate of Ammonia.

Only recently the industry has been urged to increase the production of sulphate of ammonia. How to do this in present circumstances is not clear. On account of the coal position, it must work its retorts at the highest possible temperature; it cannot afford to do anything that will diminish its output of gas. It can take some precautions (where these have not already been taken) to prevent the loss of ammonia from syphons and uncovered storage. But it can do little else while current conditions persist, much as it would like to do more. In his address to the Midland Association last Thursday, Mr. W. Chaney supplemented prior illustration to show the beneficial effects in this direction of the intimate admixture of lime with coal. By this means, in the case to which he refers, and with the coal mentioned, an increase of 15 to 20 p.ct. of sulphate of ammonia has been obtained during the past two and more years. In another case, the ammoniacal liquor (10 oz. strength) was increased by 3·94 gallons per ton. These figures remind of the Cheltenham working. But who in these times dare to venture to alter his working by introducing a fresh method that demands more labour for grinding-down the lime and intimately mixing it with the coal? Moreover, most gas-works would require the lime brought by rail, and railway trucks are scarce.

Prices of Sulphate.

But while it is desired that gas undertakings shall do their utmost to produce every ounce of sulphate of ammonia possible,

hitherto during the war there has not been in the controlled price the encouragement, having regard to increased costs, that there should be. A report of the Sulphate of Ammonia Association issued some time ago showed that the matter was receiving very careful consideration, with the view to an appeal for a revision before the new prices were fixed. Readers have been looking for some pronouncement on the subject. They will probably hear within the next fortnight or so.

PERSONAL.

Mr. J. H. Stevenson has been appointed Secretary of the Portadown (Ireland) Gas Company, in succession to the late Mr. J. C. Fulton, J.P.

Mr. Thomas A. Harper, of Forfar, has been appointed Manager (out of 48 applicants) to the Ayr Gas Company, Ltd. Mr. James Purves, the late Manager, died last week in hospital, under sad circumstances, the result of an accident that happened to him a fortnight ago.

Mr. W. B. Leech, who has since the beginning of 1914 occupied the position of Engineer and General Manager of the Leeds Corporation Gas-Works, has been appointed Engineer of the Beckton works of the Gas Light and Coke Company in succession to Mr. T. S. Lacey. Before going to the Leeds Gas Department, Mr. Leech was principal of the firm of Messrs. Leech, Goodall, & Co., Gas Engineers, of Pepper Road, Hunslet. He has had a wide experience of constructional work, and gas manufacturing plant.

Mr. Walter Lister has been appointed to the position of Manager to the Deal and Walmer Gas and Electricity Company, in place of the late Mr. J. J. Kirkham. Mr. Lister has been in charge of the works since March last year, as Managing Foreman, and vacated his position as Manager of the Malmesbury Gas Company, in order to go to Deal. In 1906, when Manager of the Godalming Gas Company, he read a paper on a "Dust Preventative for Public Roads," before the Wales and Monmouthshire Institution of Gas Engineers.

As a frontispiece to the April issue of the City of Birmingham "Gas Department Magazine," there is a portrait of Mr. A. W. Smith, whose appointment as Secretary to the Department was recently approved by the City Council. Mr. Smith has been one of the Assistant Secretaries for the last five-and-a-half years, and has also acted as Secretary to the Coal Purchasing Committee. The Gas Committee, in recommending his appointment as Secretary, pointed to the good work he had been doing in Captain Hilton's absence, and expressed their confidence that in him they were obtaining an officer whose value to the department had been fully proved. As long as 23 years ago, at the age of 15, Mr. Smith entered the service of the department as apprentice clerk under the late Mr. Henry Hack, at Saltley. Mr. Wilfrid Wastell (now Secretary to the South Suburban Gas Company) was at the time confidential clerk and assistant to Mr. Hack, a position to which Mr. Smith succeeded in October, 1903, and held until Mr. Hack's retirement in 1908, when he was transferred to the Council House as Chief Clerk in the Secretary and Manager's Office, working under Mr. Wastell, then Joint Assistant Secretary, to which position Mr. Smith was appointed in 1912. Says the "Magazine:" Up to this point, metaphorically speaking, Mr. Smith had followed in Mr. Wastell's footsteps; and it is betraying no secret to mention that Mr. Smith attributes much of his own success to emulation of his prototype's praiseworthy example of zealous devotion to duty. As is well known, serving under a gentleman so vigilant and exacting as Mr. Hack was a case of "make" or "break;" and an innings of thirteen years "not out" is in itself undeniable testimony of Mr. Smith's ability and worth.

OBITUARY.

The last American mail brought to this side cause for sincere regret, in the news of the death of Dr. Arthur H. Elliott, of New York. It was, however, an event for which those who knew him were not altogether unprepared, as for some time past his health had been failing. Dr. Elliott did much good work for the gas industry in the United States; and was a valued contributor to the proceedings of the American Gas Institute. He was, of course, also a genial and much-respected member of our own Institution of Gas Engineers, more than one of the meetings of which he attended. At the Jubilee Meeting, in 1913, he represented the American national organization, and, speaking at the dinner, informed his hearers that, while doing this, he was an English boy born and bred. Much of the knowledge of which he made such excellent use was obtained in the Royal School of Mines of England, and under Mr. W. H. Bradley, the Chief Engineer of the Consolidated Gas Company of New York. He was a member of the Society of Chemical Industry and of the American Chemical Society.

Scottish Junior Gas Association (Eastern District).—The annual general meeting of the Association will take place on Saturday of this week, in the Heriot-Watt College, Edinburgh. After the transaction of the formal business, a question and answer discussion will be opened on any matter of interest.

FUEL OILS AND CONTINUOUS VERTICAL RETORTS.

A conference of chairmen and technical representatives of gas undertakings in the North of England and Midlands having continuous vertical retorts (of any type) was held at Manchester last Friday, to consider the question of securing for the Government the maximum yield of oil from such carbonizing plant, whether using coal or cannel. The conference was convened by Sir Arthur Churchman, the Controller of the Munitions Mineral Oil Production Department; and he with Lieut.-Commander J. Fraser Shaw (Assistant Controller) were present. Alderman Kay, the Chairman of the Manchester Corporation Gas Committee, was in the chair. The object of the meeting was simply to give information from persistent experimental working that has been proceeding to ascertain the best conditions, with a large variety of coals, for promoting the object in view. One thing that was impressed upon those present was the necessity of increasing the oil yields of coal as well as of cannel, seeing that from the former more may in the aggregate be obtained than from the latter, in view of the relatively small amount of cannel at present available. Alderman Kay opened the proceedings. Sir Arthur Churchman, and later on Lieut.-Commander Fraser Shaw, spoke as to the necessity for obtaining the maximum yield of oil. General results realized from the carbonization of cannel in continuous vertical retorts (full data will be published when the tests are completed) were given by Dr. Harold G. Colman; while Mr. John West supplied detailed information regarding the results from coal. Mr. John Bond also addressed the meeting. Generally speaking, the results given showed the practicability of considerably increasing the oil supplies of the country without diminishing the output and quality of gas from continuous vertical retorts. This was a point upon which much emphasis was laid, as it is an important matter in these days of dear coal and short delivery. Speeches were made from the body of the hall; and these were sympathetic towards the objects for which the conference was convened. It should be mentioned that Sir Arthur Churchman has appointed an Advisory Committee to assist him in this matter. The members are Mr. John Bond, Mr. Charles Wood, Mr. John Young, and Dr. Colman.

A COALITE "REPLY" TO CRITICS.

One of the strange features of the articles in the "Financier" on the Coalite Process is that this particular system of so-called low-temperature carbonization, with such an abundance of vaunted merit, should require all these wordy effusions from the pen of a man who is neither a high-temperature nor a low-temperature carbonizing expert. The article of the series published in Easter week purports to be a "reply" to criticisms that have been published; and the writer in our financial contemporary has fallen into the stupendous error of supposing that a compound of assertion, and nothing more, is a sufficient answer to criticism from technically qualified sources. It is clear he realizes he is not on very secure ground. He has discovered that the "high-temperature bias" of the "Journal" "finds expression in hectic incoherence and blatant unreason," which is an extremely suitable description of much of the material that incompetence to judge of its character has led him to include in the articles—whether advertisements or otherwise is best known to himself.

In the early part of the "reply," it is stated that the Engineer of the Yorkshire Electric Power Company (Mr. W. B. Woodhouse) is more than ever convinced regarding the potentialities of the Coalite process. We do not know that Mr. Woodhouse, being an Electrical Engineer, has any special qualifications that permit him to pass judgment upon any coal-carbonizing process. But we had better quite understand what the Editor of the "Financier" means. Is Mr. Woodhouse convinced of the potentialities of the Coalite process, or of the Mond process of utilizing part of the resulting coke, or "cheap slack and coke breeze," in producers for the making of gas which can be used at one of the Electric Power Company's generating stations? There is a great distinction between the Coalite "process" and the gas-producers. Is, too, Mr. John Christie, the Electrical Engineer of Brighton, still the same believer in the outstanding virtues of the Coalite system now that it has dawned upon him that it is just as easy to get Mond producers of his own and coke or coke breeze from an old-established local concern, without bringing another fuel competitor into the district of Brighton? We again ask for the evidence to show that the Government, since their speculation of £10,000 in the Barnsley Fuel Company (which sum they declined to increase), have evinced any more interest in the Coalite plant than in any other low-temperature process.

There is little use in commenting upon the whole of the rigmarole that purports to be a "reply" to criticism. We will make one technical point (which is the cardinal one) from the mass of pure assertion. It is stated that, "with the vertical retorts of the Coalite system, there are varying degrees of low temperature, and a corresponding diversity of products." But if three times the quantity of benzol is obtained by the Coalite plant of which gas-works processes are capable (the Editor of the "Financier" might say to which gas-works processes he refers), then the Coalite process is not a "low-temperature" one. He cannot have it both

ways—that the Coalite process is a low-temperature one, and that it produces three times the quantity of "benzol" of which gas-works processes are capable. One or other of these statements cannot well be true. Here he is dealing with the criticism of Dr. Mollwo Perkin which appeared recently in our "Correspondence" columns; and this carbonizing layman, from the editorial chair of the "Financier," accuses Dr. Perkin of not being a "practical man." Surely Dr. Perkin is superior to the Editor of the "Financier" as a chemist as well as a physicist. The financial writer does not make the same remark of Prof. Armstrong, who not long since was forcibly saying unpleasant things of directors of gas companies, and was advising them—much to the amusement of men with life-long experience in coal carbonization—to become converted from the error of their ways, and to exchange low-temperature carbonization for high temperature, and so (this was what such ignorance meant) prepare for the final extinction of the gas industry. Perhaps, however, this same incompetent judge, who arrogates to himself the capacity of determining from paper and verbal information supplied to him, the rights and wrongs of this matter, will say that Dr. Dunn, of Newcastle-on-Tyne, is not "a practical man." He was, as will be seen by a report last week, recently addressing the Coke-Oven Managers' Association upon this very question. In connection with what he had to say, it may be observed that our criticisms of the "Financier" articles have been directed to the inflated claims made through them by the Coalite people; and it has been clearly stated by us that there are products of low-temperature carbonization with which in quantity and quality high-temperature carbonization cannot compete, just as there are products and a field of trading for high-temperature carbonization with which low-temperature carbonization cannot compete. Now let the "Financier" writer compare what he has written with what Dr. Dunn says. It will be seen that the latter states that from the scrubbing of the low-temperature gas, one gets light liquid hydrocarbons similar in character to the benzol one obtains by scrubbing coke-oven gas. But they are not benzol at all, and are of no use whatever for the production of benzol derivatives, such as are needed for explosives, aniline dyes, or any of the other enormous number of synthetic chemicals which are made from benzene or its homologues obtained from coal tar in ordinary high-temperature working. Distillation at low temperature results in a very much greater quantity of liquid products (of oils) than distillation at high temperature. But these oils, though useful for fuel purposes, are almost entirely paraffins or cyclic paraffin hydrocarbons, and the tar contains no hydrocarbons or very little hydrocarbon of the benzene series. How does the "Financier" writer reconcile this with what he has been put up to state in his articles? He has either to renounce the term "low-temperature" as applied to the Coalite process, or much of what he has written in his articles. Which is it to be? The vague and feeble assertions in his so-called reply to criticism are insufficient.

The article is not a positive reply to the critics. We challenge the Coalite Company to take up point by point the criticisms of the articles—points showing omission and misstatement, as well as inferring a certain particular affection for the Coalite system on the part of the Government and the Board of Fuel Research which has no foundation in fact. On the whole, we think that a little more modesty on the part of the Coalite people would have better assisted them in influential quarters than will do these inflated writings. Even the boastful capital-lettered line—"Reply to Critics who Question Facts and Decline a Challenge"—has its humorous and misleading sides. A layman might think that the challenge of a Mr. D. H. Macpherson referred to the whole of the Coalite process and the results, whereas it relates to the question as to which coke is the better for combustion purposes—one that contains a rather higher percentage of volatile matter than one containing a lower percentage. There are no two opinions as to which is the better for some purposes—such as for the domestic grate—while the other kind is the better for purposes of another order. Now are the Coalite people prepared to accept these conditions for the challenge: To include the whole process and results; to hand over the Barnsley plant to unfettered working and investigation—at the "varying degrees of low temperature" preferred by the Coalite Company—by a chemist and an engineer from the gas industry; and to publish in the "Financier" [we will also publish them in the "Journal"] articles, which will include the results, just as written by the technical investigators? We await, with interest, the answer to this suggestion.

Midland Junior Gas Association.—The annual general meeting of the Association has been fixed for Saturday next; and in conjunction therewith a visit has been arranged to the Birmingham Gas Department Industrial Research Laboratories at the Council House and the foundry and shops for heat treatment and hardening at the Windsor Street works.

Eastern Counties Gas Managers' Association.—The spring meeting of the Association will be held at the Angel Hotel, Peterborough, on Thursday, May 2; the principal business consisting of Mr. J. H. Brearley's Presidential Address, and a paper by Mr. H. R. Wimhurst, of Bury St. Edmunds, on an "Intermittent Tar Dehydrating Plant." The members are to be entertained at luncheon by the Chairman and Directors of the Longwood and Slaithwaite Gas Company. It is now some years since a meeting was held at Peterborough.

ELECTRICITY SUPPLY MEMORANDA.

We are pleased to see the tone of the articles in the "Electrical Review" and the "Electrical Times" on the subject of the new rationing regulations for gas and electricity. It is recognized that the two industries are to-day companions in adversity—adversity made the more poignant by the excessive control which is being exercised from fuel supplies to business done. There is recognition in our contemporaries that the Coal Controller has made a mistake. Hitherto economical consumers are being punished for their economy; and fresh troubles are being piled on both gas and electricity undertakings by making them, with no spare staff to do it, the overseers of their consumers' doings in keeping faith with the new edict. This on top of all previous orders and instructions, and working under the limitations that arrest efficiency at all points, are enough to break-down the hardiest of gas and electrical engineers and managers. But this five-sixths rationing scheme is a difficulty that has not come alone; and, again, many gas and electricity undertakings in London and the South have a common trouble. Quite a number of them have been dependent upon seaborne coal; only those whose coal has been conveyed by very small boats have that means of transport left to them. The others are all relying upon railway carriage; and some of them have had no coal in since the ships were taken from them or their contractors. Railway wagons are not to be obtained for the mere asking; and a complete revolution of the railway coal traffic southwards will have to be made. Altogether it is a pretty mess. Orders for gas and electricity rationing and reductions of coal supplies to public utility undertakings are so easily made; but there is an abrupt ending to the easiness. It will take the Coal Controller and all his staff some time to adjust the new muddle. They will have to look pretty smart about it, or there will be a serious collapse in the supply of gas and electricity in some quarters. Of course, electricity concerns have in the coke from gas-works a second string to their bow; but it looks very much as though, if there is a shortage in coal supplies in London and the southern counties, there will be a big clearance of coke stocks. Our electrical contemporaries foresee what we have also foreseen, that if the heating agents which the companion industries supply are curtailed by the continuance of the five-sixths ration, it will mean a larger use of household coal if obtainable; and this will recoil upon the Coal Controller. For cooking purposes and room heating, coal is wasteful where gas is obtainable. It is all very well to ask the public to be patient, and to patriotically comply. They will be patient and comply up to a point. But if the position does not mend, but get worse, there will be a deafening outcry from the public, which will not fail to reach Whitehall Gardens and the Holborn Viaduct Hotel.

Companions in Adversity and the Coal Muddle.

Out of evil good may come. The heavy increases in the prices of gas and electricity through the war are arousing consumers in the areas served by municipal undertakings to see the financial inequity of the proceeding of making them pay, through their use of gas and electricity, any part of the burden of local expenditure that should be raised from the ratepayers generally. If they had betimes hearkened to advisers, they would long ago have put a stop to this sort of thing; but while the prices of gas and electricity were fairly moderate, they allowed the matter to slide, with an indifference to consequences. Over the question, the Manchester and Salford Trades and Labour Council are up in arms, together with the Manchester Labour Party. The Lord Mayor of Manchester has received a deputation on the subject; and the Manchester City Council have discussed it. But protest notwithstanding, a report of the Trading Profits Special Committee—recommending that in future the contributions of the Gas and Electricity Departments should be upon the basis of 1 p.ct. of the aggregate capital expenditure [Why the aggregate, and not the outstanding?], and that of the tramways 5 p.ct.—has been adopted; the assertion being that, if it were not, the alternative would be 10d. in the pound on the rates. This only emphasizes how the gas and electricity consumers are being robbed. Here are two concerns paying in these times all the war burdens incidental to "carrying on" business, together with all their ordinary financial obligations, and yet this is supplemented by a charge to relieve the ratepayers generally of their obligations—ratepayers who have never, in the case of the gas undertaking, had to pay a pennypiece towards its support. We are glad to see that industry through the Trade Council and working people through the Labour Party have jointly registered their protests. Gas is patronized very largely by the working classes, and to indirectly tax them in this way is the height of bad statesmanship and government; and so is the charging of the services of gas and electricity to the industries at a higher price than necessary. This would not be necessary if the total revenue required for the government of the city was drawn proportionately from its one and correct source. Unfortunately, there is a majority of the Manchester City Council who prefer to perpetuate bad statesmanship and bad government by recourse to indirect taxation through gas and electricity. However, war time has drawn closer public attention to the matter; and public

The Public Voice and Trading Profits.

resentment will probably grow. The public voice will not always be silenced; and we hope that now it will persist in making itself heard, to the end that this form of abuse will be wiped-out, and another reform be added to the credit of wartime.

Electricity for Power Purposes.

In view of the lower service that the electricity industry gives to the nation than the gas industry, and the comparatively poor use that it makes of the coal charged under its boilers, it is right that the Ministry of Munitions should be extremely careful to whom it issues priority certificates for motors and other electrical plant which require a supply of current from a town's cables. With the view to reducing official investigation, the Ministry now require applications for priority certificates to be accompanied by a certificate from the chief engineer or manager of the local electricity undertaking stating: (1) That adequate generating plant capacity is or is not available. (2) That no additional cost or material is involved in connecting the premises to the mains (including sub-station equipment, if any). (3) Where expense is involved, the material and apparatus to be provided and the cost thereof, and whether lead-covered cable is necessary or not. Where lead-covered cable is deemed necessary, the voltage of the current transmitted has to be stated. Applicants have, whenever possible, also to obtain the written support of the Government Department interested in their manufactures, and forward a copy. In other words, there will apparently be little use now in asking for priority certificates for would-be consumers' installations, unless real war work is the object.

Electricity and After the War.

We wonder whether Mr. Merz was at the back of a resolution discussed last Wednesday at the annual meeting of Chambers of Commerce in London. At all events, it emanated from the Newcastle Chamber of Commerce, with which doubtless Mr. Merz and many of his friends have some connection. The resolution states that the Association, recognizing the urgent necessity of increasing the productivity of the country's industries after the war as the chief means to meet the burden of the war debt of the nation, and to maintain high wages for the workers, urge His Majesty's Government: "(*a*) to recognize that the public supply of electrical energy for power, light, traction, heat, electro-chemical and other purposes, is a key industry, insomuch that all other industries are becoming increasingly dependent upon it. (*b*) To hasten the amendment of the legislation which has hitherto hampered its efficient development. (*c*) To ensure the supply at the earliest possible date of ample and cheap electricity for all purposes. (*d*) To conserve our coal resources, the chief wealth of the country, by compelling the exercise of the maximum possible economy in its use for industrial, domestic, and all other purposes." We hope His Majesty's Government, before "recognizing" too much, will ascertain as to whether there are not some other means of conserving our coal resources, and putting them to better use than is exemplified by electricity generating stations to-day. Some suggestions for them may be obtained from Mr. W. Chaney's Presidential Address to the Midland Association of Gas Engineers and Managers, as published to-day in other columns.

THE RELATIVE IMPORTANCE OF GAS, WATER, AND ELECTRIC UNDERTAKINGS IN THE WAR.

By "Cricket."

Nothing would have induced the writer to make an attack on electric undertakings had it not been for Mr. Napier Prentice, the Engineer and Secretary of the Suffolk Electricity Supply Company, urging in the public Press last week the use of electricity in place of coal or gas, as it is necessary to rebut the idea that electricity is in any way playing such an important *rôle* as gas in the progress of the war. Electricity in wartime stands a very bad third as regards places in the group known as Public Utility Undertakings. Water in wartime is of considerably more importance than electricity.

Let me, however, diverge from my task for a moment and enquire as to why gas should be continually bracketed in Government circles with water and electricity as merely a public utility. It is more. It is of vital national importance; but it generally finds a place at the bottom of the list of Protected Scheduled Occupations under the bushel of "Public Utility." Its real place is at the top of the list, followed by coke-oven works.

Let me repeat what has been stated in my previous communications in the "Journal." The war would be lost if gas-works and coke-oven works were to cease operations, as the whole of the hundreds of useful products which find themselves needed in some way or other in every vital manufacture would be lost. The whole of the valuable products are derived from only about 18 p.ct. of the home consumed coal. It is not right to class the gas industry merely as "public utility."

Do the electricity works distil coal and produce sulphate of ammonia for food culture, sulphur for sulphuric acid, tar, carbolic acid, dyes, picric acid, fuel oil for the Navy, benzene and toluene for explosives, coke, gas, retort carbon, pitch, &c., &c., as gas-works do? They do not, but only burn coal and produce light, power, heat, and ashes. They produce no valuable bye-products, and are not rightly classed as "public utility undertakings," for they certainly are not vitally important to the country at war. But gas-works are.

Electricity certainly supplies current for power and lighting, to a fairly considerable extent, and a small amount for cooking and heating. But there is very little indeed which electricity does which cannot be done by gas. It has its usefulness; but it also has its limitations. Gas is considerably cheaper in all respects than electricity. In future, all electric current should be derived from gas-engines, and thus contribute to the hundreds of useful products derived from the distillation of coal.

I have heard electricians state that they are great economizers of coal, because some years ago they used three tons of coal to generate electricity now derived from one ton of coal. That in nowise proves that they are economizing coal; it only indicates that they are not wasting as much coal as they did formerly. Their coal could be used to far greater advantage in wartime at gas-works. The current they generate is used as a luxury to a considerable extent, especially in regard to lighting; and it is altogether proper that (as now) electricity—except for direct war work—is rationed. But it is a mistake to have rationed coals to gas-works, and drive them to use a substitute made from coke and steam, and lose valuable products vitally necessary to the nation—fuel oil for the Navy, for instance.

The coke produced at gas-works should be used in the steam-boilers at electricity works to generate the current necessary for the rationed supplies; and the shortage of coal at gas-works should be relieved by transferring to them the coal intended for electricity works, so that gas-works may form as nearly as possible—especially in summer time, when retorts are available—100 p.ct. of good rich coal gas and the attendant vital bye-products.

Water-works are necessary at all times, and especially so in wartime. They stand pre-eminently in front of electricity works, because electricity works could be closed-down to a considerable extent without any harm being done. But a shortage of water would create untold horrors in the way of epidemics and stop many vital industries. Water-works chiefly use coal as a means of providing power for pumping operations, but could use coke to a considerable extent instead, and thus free coal for gas-works. Moreover, fuel at water-works could be economized to a great extent by the stoppage of the water-wastage which still goes on. For domestic use, one often sees the tap full on for a long time washing a cabbage; and probably the water used in many cases very nearly equals the cost of the cabbage. Then, again, although it is necessary to have perfect sanitation in public conveniences, how often does one see an altogether too lavish use of water? Water-works managements should be compelled to see that water is not wasted. Wasted water means wasted fuel, not only in a direct sense but in an indirect sense, because the lavish use now made in the ways described helps to fill the sewers; and in consequence in many cases causes unnecessary sewage pumping and additional labour at the sewage works.

PRICING GAS BY THE HUNDRED.

By A. Canning Williams, of Edinburgh.

It was with much interest that I read of the innovation recently made at Blackpool—a town which consistently lives up to its motto, "Progress"—of pricing gas by the 100 c.ft. instead of by the 1000 c.ft. The idea has been spoken of from time to time—my colleague, Mr. Alexander Masterton, for example, having suggested to his Commissioners six years ago that the change should be made. But I believe the Blackpool gas undertaking, on the advice of their Engineer, Mr. William Chew—of personal happy memory, for I worked under him for some few years—is the first town in England to adopt it in actual practice. In Scotland, despite its alleged conservatism, two small gas companies in Fife, under the management of Mr. James J. Scott, have now for some years charged for gas by the 100 c.ft.; and he says that the new method "has absolutely everything in its favour."

Commending the idea to his Commissioners, Mr. Masterton said:

"It has occurred to me that the method of stating the price of electricity has been the means of attracting many customers—this figure appearing such a small one, and the average consumer having but a hazy idea of the capacity of the unit, and little or no knowledge of comparing it with gas. So that I calculate if the price of gas were quoted at so much per 100 c.ft., with notes as to the amount of light and power derivable from same, it would place gas on a much better footing in competition with the electric light."

This is the aspect of the matter which appeals strongly to the "Journal," for it was observed in the issue for March 19 (p. 540): "The great point is that 100 c.ft. of gas supplies a unit which brings the prices nearer to those charged for electricity, though still not disclosing the great disparity of value in service in favour of gas."

It would, of course, be absurd to imagine that a mere change in the method of stating the price would bring about a large addition to the number of gas consumers, or induce existing consumers to use more gas. But it would be a distinct move in the right direction, and, seeing that gas and electricity are such keen

DIAGRAM OF "GAS RATION CARD" ISSUED BY THE BOURNEMOUTH GAS AND WATER COMPANY,

UNDER THE LIGHTING, HEATING, AND POWER ORDER, 1918.

[See "Correspondence," p. 100.]

Notice to Consumers of Gas.

According to the provisions of the Lighting, Heating and Power Order, 1918, consumers of gas will only be allowed five-sixths of the quantity of gas consumed on the *same premises* in the corresponding quarter of 1916 or 1917, whichever is the greater. This regulation does not apply to cases where the consumption is less than 3,000 cubic feet per quarter in the Midsummer and Michaelmas quarters, or 3,500 cubic feet in the Christmas and Lady Day quarters.

All infringements of this Order have to be reported by the Company to the Board of Trade.

Your ration for the four quarters will be as follows:—

	CUBIC FEET.
Quarter ending Midsummer, 1918	
„ „ Michaelmas, 1918	
„ „ Christmas, 1918	
„ „ Lady Day, 1919	

Where extra apparatus has been fitted in any premises between March 25th, 1917, and March 25th, 1918, an extra assessment will be made by the Company on receipt of the necessary information from the consumer.

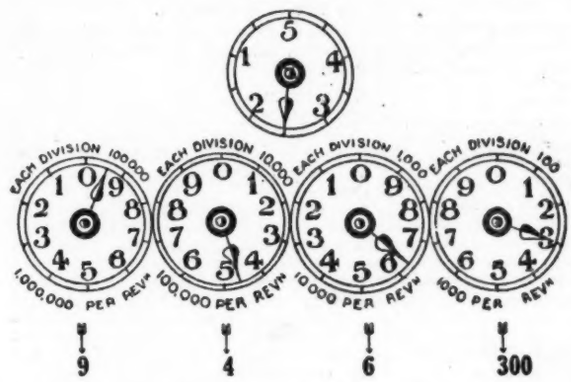
The Bournemouth Gas and Water Company suggest that great assistance in keeping within the rationed allowance of gas will be derived from the systematic reading of the gas meter by consumers at intervals of not more than one week.

If the accompanying instructions are carefully followed it will be found quite simple for consumers to read their own meters.

P. G. G. Moon,
Acting General Manager,

Head Office, Poole Hill,
Bournemouth, April 2nd, 1918.

Instructions for Reading Gas Meters



Pay no attention to the top dial, which is for the purpose of testing the meter only.

Take the four lower dials in their order from left to right, and put down the figures indicated by the hands. If the hand is *between* two figures, write down the lowest, unless the hand is between 9 and 0, when write down 9. Then add 00 to the end.

The above index reads 946,300. If the reading of a week before had been 944,000, the week's consumption would have been 2,300 cubic feet.

This Reference Number must be given if any enquiries are made respecting the above rations. .....

competitors, there is no reason why one of them should voluntarily assume a handicap, however light.

That invisible but potent power, "Use and Wont," makes us do, in all departments of life, many things which, upon a close scrutiny, are found absurd or illogical now, however wise they may have been in some more or less remote period of the past.

> For men are prone to go it blind
> Along the calf-paths of the mind,
> And work away from sun to sun,
> And do what other men have done.
> They follow in the beaten track,
> And out and in, and forth and back,
> And still their devious course pursue
> To keep the paths that others do.

On the gas bills the meter-readings, &c., are often shown in some such way as this:

		At per 1000 C.Ft.
Present index of meter . .	826	
Previous index of meter . .	684	
Gas consumed (in hundreds).	142	. . 3s. 6d.

This method of stating the account is, to the ordinary non-arithmetical consumer, mystifying, and makes the checking of the £ s. d. figures—where it is attempted—a matter of much pen-nibbling and knitting of worried brows. Some may even consider that it is purposely made difficult of check; and so the suspicion of gas purveyors is deepened. What should we think of a fruiterer who sent in a bill like this: 142 lbs. of plums at 6s. per stone?

It may be urged against charging by the hundred that an increase in the price of gas would, in many cases, involve a fraction whose denominator might be one to which the general public are not accustomed—as three-eighths, three-tenths, and so on.

There are many who can deal with calculations which go as far as farthings, but who get out of their depth when an unusual figure, such as an eighth or a tenth, comes along. But our friends the enemy charge for electricity on these fractional lines; and the Edinburgh Electrical Engineer tells me that he has never heard any objection to the practice. A sensible person would probably take the view that great care had been exercised before so "fine" a figure had been arrived at, and that the price was the very lowest that could be charged with financial safety.

It is beyond doubt, I think, that less irritation would be caused to consumers if an increase in rate were stated at per 100 c.ft. An intimation that the price of gas will be increased by ½d. per 100 c.ft. would pass almost unnoticed, whereas 5d. per 1000 c.ft. would probably cause complaints and murmurs, and the relief of outraged feelings by way of communications to the local press. I have noticed in Edinburgh that increases in the price of electricity rarely result in newspaper comment—editorial or otherwise. Of course, reductions in price would appear equally infinitesimal; but people do not grumble and economize on hearing that a commodity is cheaper.

With regard to working details, estimates, &c., it is doubtful whether it would be advisable to calculate these on the basis of per 100 c.ft. of gas sold, and so add to a refinement which, even on the 1000 c.ft. footing, is sometimes almost unintelligible. Take, for example, the following figures relating to the Edinburgh and Leith gas undertaking for the year 1916-17:

	Per 1000 C.Ft. of Gas Sold.
Purification	0·06d.
Rents, &c.	0·08
Superannuation fund.	0·05
National insurance	0 07
Compensations	0·06

In order to grasp the meaning of the above, the ordinary mind finds it necessary to turn the decimals into vulgar fractions, six-hundredths of a penny, for instance, being more easily comprehended than point nought six of a penny. Were the figures further divided by ten, the difficulty of understanding them would be increased.

The question of the manner of stating the price of gas on the consumers' accounts is entirely a commercial one; and I have little doubt that, if pricing by the 100 c.ft. were recommended by their official advisers, directors of gas companies and members of gas committees would, as business men, see the wisdom of the departure, and give it hearty approval. It is, therefore, "up" to us, my brother officials, to move in the matter.

MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.

THE Annual General Meeting of the Association was held last Thursday afternoon at the Grand Hotel, Birmingham. There was an attendance of between forty and fifty members, to hear the Inaugural Address of Mr. W. Chaney, of the Saltley Gas-Works, Birmingham—the new President. Afterwards consideration was given to several questions (arising out of the times) that are of importance to gas managers.

Mr. GEORGE STEVENSON (Long Eaton), the retiring President, occupied the chair during the earlier portion of the proceedings.

MINUTES OF THE LAST MEETING.

The HON. SECRETARY (Mr. W. G. S. Cranmer, of Willenhall) read the minutes of the previous meeting. He also announced the receipt of several apologies for absence.

COAL SUPPLIES.

Mr. W. C. JONES (Brierley Hill) inquired whether anything had transpired other than what was already known to the members with regard to the action taken in connection with coal supplies in their district. In the case of his own particular works, no improvement whatever had taken place in the matter of coal supplies; and he believed that other works were in a similar position. So close had he been that on some occasions he had come within two or three days of having to shut-down; and the only satisfaction he could actually get from the Coal Controller was probably a rush of coal for a day or two, and then a dropping off again. Further correspondence simply led to a letter to the effect that the matter was being taken up. For the quarter ended March 31 last, he had received against his contracts practically 350 tons, instead of 900 tons. He had had to pay other companies to get coal; and then it had come from within a few yards of where his own coal, which he could not get, should come from. He thought some stronger action should be taken, and would like to know whether anything in particular had been heard by the Association with reference to coal supplies.

The PRESIDENT replied that there had been no further development officially as regarded the Association. After the meeting last October they collected various statistics, and sent them to the Coal Controller, with the object of impressing upon him the necessity of some quick action, particularly for gas-works in certain districts. The reply was, as stated in the report, that the undertakings concerned should communicate with the local Coal and Coke Supplies Committee. Nothing further had been heard by the Committee officially; and he was doubtful whether they could do anything more. He very much regretted that the Coal Controller had not acceded to their request that the Association should have some representation on the Coal and Coke Supplies Committees. It would have been a step in the right direction; and they could urge it again. The coal supplies varied very greatly. Some of them had ample; while others had practically none at all. He would suggest that perhaps they might get some further statistics from members who were suffering badly. If there were a large number of instances like that of Mr. Jones, it would be an advantage to have revised statistics, so that they could present a concrete case.

Mr. THOMAS BERRIDGE (Leamington) said he thought that they could get Durham coal, if they cared to pay the price, and were able to obtain the wagons.

The minutes were then adopted.

THE REPORT AND ACCOUNTS.

The Committee presented their fortieth annual report, in which it was remarked that, at the meeting last October, the subject of coal supplies was discussed; many of the members complaining, not only of the quality, but of the inadequate quantities allotted to their undertakings under the scheme of the Controller of Coal Mines. It was decided to obtain particulars of these, and communicate them to the Coal Controller; pointing out the very serious position the works were placed in, and asking his reconsideration of the matter. This was done; but it resulted only in the request that the Association should communicate the figures to the local Coal and Coke Supplies Committees. The Committee had previously asked the National Gas Council to point out to the Coal Controller the desirability of the gas industry being directly represented on the local Coal and Coke Supplies Committees; and other District Associations were asked to give their support. Unfortunately, the Coal Controller was unable to adopt the suggestion. The Committee regretted to have to record the death of two members—Mr. J. R. Heath, a member of some years' standing, and late Engineer and Manager of the Etruria works of the British Gas Light Company, and Mr. J. H. Willoughby, the Manager of the Brownhills Gas Company. The accounts showed a balance in hand of £71 14s. 10d.

A VOTE OF CONDOLENCE.

The PRESIDENT said he would propose the adoption of the report and accounts; but, before putting the resolution, he would like to refer to the fact that they had lost two esteemed members of the Association since the last annual meeting—Messrs. J. R. Heath and J. H. Willoughby. As a mark of their respect, he would ask the members to rise silently in their places. [This they did.]

THE AFFILIATION FEE.

The accounts called for very little comment. As regarded finances, they were well on the right side. There were even subscriptions paid in advance, which was an exceptional state of affairs. The Institution of Gas Engineers had asked the Association, among other District Gas Associations, to increase their affiliation fee, which had been £5 5s., and make it £10 10s. The Committee strongly recommended that this request should be acceded to. The position was that it had been the custom of the Institution to pay the railway fare of a member representing a District Association; and this railway fare—especially at the present enhanced rates—came to a great deal more than the affiliation fee. Therefore, if they wanted to be independent, they must at least pay to the Institution a sum equal to that which the Institution refunded to the representative for his train fares; and £10 10s. for the next twelve months would barely do so, because there were likely to be a great many meetings.

Mr. B. W. SMITH (Walsall) seconded the adoption of the report and accounts.

THE ASSOCIATION FINANCES.

Mr. H. E. COPP (Etruria) inquired whether the Committee had in their minds any plan to enhance the revenue of the Association, because, so far as his memory served, he believed for the last ten years the balance had been steadily declining. If the expenses were to continue at the same rate, some means must be found of increasing the revenue.

The PRESIDENT replied that the Committee had considered the question; and they had decided not at the moment to increase the subscription fee of 10s. 6d. It was thought that, as the Institution had raised their fees, and their own Association had a considerable balance in hand, the question might very well be left over for this year, at any rate.

Mr. BERRIDGE suggested that they might discontinue sending to every member a copy of the "Reports of District Associations." This cost a good deal; and many of them got two or three copies.

The HON. SECRETARY said he thought, if Mr. Copp would carry his mind back, he would remember that the balance in hand had been depleted by donations to special purposes. There was £50 to the Livesey Memorial; and then on two occasions there had been rather large donations to the Benevolent Fund of the Institution. The reduction in the balance was entirely due to these three items.

The report and accounts were then adopted.

REPORT OF THE COMMERCIAL ASSOCIATION—COAL AND COKE PROBLEMS.

Mr. J. FERGUSON BELL (Derby), in presenting the annual report of the Midland Commercial Association, mentioned that at the beginning of the year the membership was 47, and at the end 50. He noticed that there were 103 members of the Midland Association; and it did occur to him that it would be well worth the while of every one of them to be a member of the Commercial Association. Financial and technical matters were so interwoven at the present time that it was highly desirable that this course should be taken. There had been during the year ten general meetings, at which several very important matters had been discussed. One was the supply of coal. They had done all they could to try and forward the supplies of coal. If now members in trouble would bring to the notice of the local Supplies Committee, and press upon them, the precarious position they happened to be in, this would be the best way of getting attention; and they should also approach the Coal Controller. With the comb-out of the miners, the position of coal supplies was very likely to be more difficult this year than it had been in the past; and for many of them it was difficult enough last year. Members should therefore take every possible means of bringing pressure to bear on the collieries, so as to get coal deliveries during the summer months. Mr. Pooley arranged for about half-a-dozen members to approach the Coal Controller with reference, not only to supplies of coal, but also of coke. The coke question unfortunately at the present time was the one serious block for many of them. Coke seemed to be drooping; and as this formed so large a portion of their revenue, it was very important that they should take steps to keep up the price—especially as there was no likelihood of any reduction in the price of coal during the stress of war. Well, the deputation he had referred to had an interview lasting several hours with the Coal Controller, who said inducements should be offered to consumers to substitute coke for coal. The deputation pointed out that a very large proportion of gas coal was now used for household purposes; and if he wanted them to use coke, the only thing was to stop the supply of the coal, so that they would have to do so. He (Mr. Bell) was quite certain that the remedy was to stop the supplies of household coal to a large number of towns. It did seem a matter for regret that, if the Government were short of necessary products for this terrible war, gas-works should be hampered for want of supplies of coal. If the Coal Controller would only stop sending coal—especially during the summer months—to the different towns, then householders would make freer use of coke in the future than they had done in the past. The Coal Controller said they had been trying coke in their offices, and found they could easily heat them with coke and a very small proportion of coal. They must all push to the utmost the sale of coke in their districts.

THE DISPOSAL OF TAR.

The question of tar, of course, had been difficult and pressing. The National Gas Council had now taken the matter up, and were trying to see whether some equitable arrangement could not be come to with the tar distillers. Many of the smaller works—especially in the past—had felt that they had not got as much for their tar as they were entitled to. Whether or not this was the case, they could not tell; but the Commercial Association had nominated Mr. Stevenson (who was well acquainted with the distillation of tar) along with himself to deal with the matter; and they would, so far as they were able, see that the views of the Association were kept well to the front. There was no doubt some equitable scheme could be adopted, whereby, especially the smaller undertakings, would be paid a fixed price relative to the value of the products, leaving the tar distillers a reasonable profit. They did not want them to work at a loss; but they did say that when

prices went up, they should share with them. If some such arrangement could be come to, it would be satisfactory, not only to the gas undertakings, but to the tar distillers.

Labour.

The only other point on which he would touch was that of labour. They had done all they could to get a more favourable award; but they had to pay the 12½ p.ct. and the other additions stated. This meant a very serious tax on the gas industry; and it would be necessary for most of them to further increase the price of gas. The sooner the consumers fully realized what it meant, the better. He had a list of comparative prices of goods before the war and now; and he found that practically everything they touched as an industry cost to-day double what it formerly did. This being so, it was impossible to sell gas at anything like the price they did in pre-war times. It was a pity that a great many more industries were not in the same position as the gas industry—that the higher the price of the commodity they sold, the lower were the dividends they could pay. If this was the case, they would not be paying some of the heavy prices they had to do at the present time. However, the nation was at war; and they were doing their best as an industry to help the war. In moving the adoption of the report, he would say again that the Commercial Association were very anxious that the whole of the gas industry of the Midlands should be affiliated with them, because in these times it was more than ever necessary for them to speak with a united voice.

Mr. F. W. Stevenson (Coventry), seconding the motion, agreed that the Commercial Association was very useful. They were all much indebted to Mr. Bell, who occupied the position of Chairman, and took the greatest possible interest in everything connected with it. His knowledge was of much value; and his services were very highly appreciated.

The report was adopted.

New Members.

On the proposition of the President, seconded by Mr. B. W. Smith, the following new members were elected: Mr. Andrew Poole, of Tenbury Wells; Mr. Thomas H. Beaumont, of Stratford-on-Avon; Mr. Hedley Hoy, of Cannock; and Mr. F. Robinson, of Swadlincote.

The New President.

The President said he felt there was no need to introduce to the members of the Association the new President, Mr. Chaney,. His knowledge of him led him to believe that, though he occupied a very high position in the gas industry, he would be accessible during his year of office to even the smallest of the members. He would now ask him to take the chair.

Mr. W. Chaney (of the Saltley Gas-Works, Birmingham), who was received with applause, said his first duty was to propose a very hearty vote of thanks to Mr. Stevenson for the able manner in which he had presided over their meetings during the past year. He had devoted a great deal of time and money to the various duties of his office, which had been particularly arduous.

Mr. B. W. Smith seconded the vote, which was cordially passed, and acknowledged by Mr. Stevenson.

The President then delivered the following

INAUGURAL ADDRESS.

I have first to express my gratitude for the honour you have conferred upon me in electing me President of your Association. It will be my earnest endeavour to fulfil the duties entrusted to me to the best of my ability, and to uphold the traditions of the Association. In an Association such as ours, much is dependent upon the mutual co-operation of its members. Our interests are the same; and to-day, perhaps more than at any period in the history of the industry, professional association is to be desired.

Effect of the War on the Industry.

At the present moment our thoughts are more absorbed in the clash of arms than in our own calling. Many members of our industry and our own kith and kin are fighting in the closing scenes of this great war; and when peace comes, may it bring full honour to those who have laid down their lives for freedom and the great cause. Since July, 1914, the gas industry has passed through strenuous and severe experiences, each yielding valuable information and bridging problems which probably would have taken years to mature. The State control of coal, oil, and other commodities; the issuing and countermanding of instructions as to high and low temperature carbonization; the request for economy of coal; and for more coal to be used to obtain the tar products, &c.—is not calculated to impress the gas industry with the capability of the State to control the gas undertakings of the country. It is not that we do not understand the need for the step, or realize that the interest of the nation is at stake; but rather we feel that the supervision and control should be placed in the hands of men experienced, and who have full knowledge of the details of the subject they have to control. Although embarrassed in carrying into effect the appeals made from time to time, by lack of labour, and the obtaining of material, the gas industry may claim that they have loyally yielded to the nation in the time of emergency and carried out their part, and are still doing their very best.

Standard Gas.

The use of gas to-day demands a gas of good combustible qualities capable of yielding high temperatures, and rendering the best service to the consumer at the lowest cost. The question of plant and the methods of carbonization enter deeply into this problem. But existing plants cannot be discarded at short notice; and in arriving at a definite conclusion, the capabilities of such plant must be taken into consideration. That a standard gas is essential is universally agreed. Equally also of importance is the standardization of appliances to be used for its consumption. It has been generally accepted that the best gas is not of necessity of the highest calorific value. Gas of low calorific value is much more easily controlled, by the fact that the air required for combustion approaches more nearly the volume of the gas consumed. Much has been written and said concerning the inert gases; but it must be borne in mind that, with gas containing exceedingly high percentages of inert gases, such as producer gas, very high temperatures are obtainable.

In the past the gas industry has been penalized by the restrictions laid down by Parliament from time to time—instancing the sulphur clauses, methods of illuminating power testing, &c.; and although the calorific standard has established a satisfactory basis, care must be taken that any further restrictions in the composition of the gas do not again restrict the freedom of its manufacture, or retard the introduction of new methods of carbonization. It is doubtful, with a standard of 500 B.Th.U. gross, whether a make of 12,500 c.ft. per ton can be legitimately obtained without the addition of inert gases from outside sources. On the other hand, if the inert gases were restricted to (say) 15 p.ct., the make of gas would probably not exceed 11,500 c.ft. per ton; while the calorific value could not be reduced to the 500 B.Th.U. standard. Reduction by means of blue water gas is now generally accepted as both an economical and a convenient means of maintaining a regular and consistent supply; and the proposals of Mr. George Helps, of Nuneaton, are valuable assets in considering this problem.

The complete stripping of the gas of benzol vapours would lower the calorific value by about 8 p.ct., and produce (say) 2 gallons of benzol per ton of coal carbonized. The extraction would be of great value to the nation at the present time. Aggregating the total quantities obtainable from gas-works and coke-ovens, some 40 million gallons would be available per annum. The large oil interests have already moved in the direction of controlling this supply; and care should be taken that the monopoly does not pass into outside hands.

Coal Conservation and Fuel Economy.

The proposals in the report of the Coal Conservation Committee contain some drastic and far-reaching alterations, which include problems relating both to the gas and electrical industries. The erection of gas and bye-product plants near the coalfields, together with large electrical generating stations, is an impressive and gigantic scheme; but much work and ground has to be cleared before such a scheme can be launched. The scheme recommended by the Committee would probably mean the carbonization of large quantities of coal at central stations for the recovery of bye-products. The gas from the plant would be turned into electrical energy, or used for power purposes; the gas and bye-product plant being combined with the electric power plant. It is to the national interest that the maximum economical results should be obtained from the coal; and providing gas and electrical experts keep to their own territory and work in harmony, the greatest good will be effected.

The distribution of gas and coke will require careful study without a full outlet is assured; and bearing in mind that one truck of coal produces nearly two trucks of coke, the saving in railway wagons and transport does not appear to be a serious consideration. Gaseous firing of boilers for the raising of steam and the use of gas for generating electric current have not hitherto met with much support; but now that greater attention is being paid to the utilization of low-grade fuels and the production of ammonia, the use of gas for these purposes should prove a commercial success. On a small scale the scheme installed at the Saltley Gas-Works is somewhat on the lines proposed by the Coal Conservation Committee. Coal is carbonized in coke-ovens, and the whole of the gas and coke therefrom are consumed in the near vicinity. Electric current for handling the carbonizing plant is generated by steam raised by breeze-fired boilers; and the coke dust and the exhaust steam from the electrical plant are converted into producer gas for heating the carbonizing plant. The coke dust, hitherto of little commercial value on account of its fine subdivision, yields from 45 to 50 lbs. of sulphate of ammonia per ton, and more than covers the cost of the whole of the labour incurred in the manufacture of the producer gas. Here all operations co-ordinate and balance; and fluctuations in the amount of coke, gas, or electric current required may be taken up by the producers without stand-by plant.

A similar sequence of the interlinking of gas and electricity undertakings would be as follows: Coke dust and other low-grade fuels, together with some of the exhaust steam from the electric generating undertakings, would be converted into producer gas, from which the sulphate of ammonia has been extracted. The producer gas is then returned to the electricity works for generating current or steam-raising under boilers, or for heating the carbonizing plants, and displacing the coke now used for this purpose. The economy to be effected would be the saving of the coal for steam-raising at the electricity station, the taking up of peak loads by gas-driven engines—thereby saving any stand-by boiler plant—the recovery of the nitrogen as sulphate of ammonia from the producer gas, and the utilizing of the low-grade fuels. In many parts of Europe gas-engines of 4000 H.P. are operating with complete success; and, if necessary, the calorific value of the producer gas could be increased by the addition of either blue water or coal gas.

In including these remarks I feel that I have launched out beyond the latitude permissible. But I had rather in mind the

initiative step taken by our electrical friends, and also the fact that I have been privileged for some years past to work in a field not furrowed generally by the gas industry, and also one which, as suppliers of gas, may eventually develop into a more distinct branch of our calling. The heating of the carbonizing plant by means of producer gas is a typical instance of the use of a gas of low calorific value for maintaining high temperatures. The average calorific value of the gas is 125 B.Th.U. per cubic foot, and a temperature of 1250° C. is regularly maintained.

LABOUR.

The industrial position of to-day and the wages question call for much thought. A living wage is not easy to define. Wages increase; and the workers who receive the highest wages are not of necessity the most skilled, but rather those whose unions are the most persistent in their claims. So that to-day the unskilled worker is probably commanding wages almost equal to those of the skilled mechanic. The stress of war, and the shortage of labour, has demonstrated the large range of employment open to women, and the dexterity with which they are capable of carrying it out. With greater co-operation between the industry and the trade unions much may yet be accomplished. The cessation of Sunday work in many gas-works has been discontinued; but with a larger employment of women the Sunday rest may again be revived.

The industrial unrest through which we are now passing instances the power of the worker, and his desire to increase his earning capacity. This is quite a legitimate ambition, providing the output is raised proportionally to the wage. The payment of a fixed wage is not a sufficient inducement for a workman to put out his best efforts. Each man should have a personal and financial interest in the undertaking that finds him employment; and a general adoption of payment by results would give a higher wage-earning capacity to the workman, and encourage him to give a greater result.

AMMONIA.

The Ministry of Munitions recently drew attention to the urgent need for an increased production of ammonia—pointing out that much could be done by working at moderate temperatures, by using moist coal, &c. Reference was also made to the losses due to leakage through uncovered wells and tanks. In another communication, the addition of lime to the fuel used for making producer gas was advocated. In the latter case, providing the lime is very intimately mixed with the fuel, there are many indications that an increase of 20 p.ct. in the yield of ammonia is obtainable. At an installation of 100 tons of coal per day, using varying classes of slack from Staffordshire, Nottinghamshire, and Lancashire, an increase of 15 to 20 p.ct. of sulphate of ammonia has been consistently obtained over a period of two or more years. Similar experiments carried out (Cooper's coal-liming process) on coal carbonized in a retort-house stoked by Fiddes-Aldridge machinery gave the following results:

Period of test	Two weeks.
Coals carbonized	1864 tons.
Slaked lime used	2 p.ct.

No increase in the yield of gas per ton was noticeable.
Cyanogen contents increased from 7·1 to 10·1 lbs. per 10,000 c.ft. (sodium ferrocyanide).
Ammonia increased, 3·94 gallons per ton (10-oz.).
Sulphur compounds reduced from 34·6 to 12·99 grains per 100 c.ft.
Sulphuretted hydrogen increased from 2 08 to 2·66 p.ct.

CARBONIZING SYSTEMS.

The Birmingham Gas Committee have reviewed the various systems of carbonization from a broad and progressive standpoint, inasmuch as they have adopted the many improved methods at their different works—the Woodall-Duckham continuous system, the intermittent or Dessau system, horizontal stoking machinery, coke-ovens, and producer gas, &c. It is not within my province in this address to criticize the advantages or the disadvantages of these various plants, as much is dependent in their selection on the local circumstances, the coal available, and the coke production. These systems have undoubtedly resulted in a considerable saving in labour and an increased yield of gas. The men are not exposed to the heat, and their duties are less arduous. More intelligence is called for from the stoker in the efficient working of these plants; and frequently their success is handicapped by the lack of intelligent attention to detail.

COAL STORAGE.

The storage of coal is a question of some moment; and though in the past our views have been somewhat divergent as to the quantity it is desirable to store, the experiences of the past few years have brought home to most of us the importance of carrying larger coal stocks. Against the carrying of larger stocks has to be set off the depreciation of the coal by storage, the cost of handling, and the depreciation of the coke produced. The risk of fire by spontaneous ignition has also to be considered—especially with coals such as Durham coal, where ignition occurs at all depths, and even in shallow stacks. The amount of pyrites, dust, and moisture favours ignition; and there does not appear to be much advantage in storing coal under cover.

The provision of mechanical means for picking up and storing coal have not hitherto been justified from a financial point of view, primarily on account of the large proportion of the year such plant is lying idle. The adoption of mechanical appliances for this purpose is more as a means of saving labour and facilitating the quick removal of the coal when required. There are limits to the use of mechanical appliances for this purpose; and in most cases manual labour has proved the cheaper. Storage under water has proved successful; but for gas-works purposes it would be hardly suitable.

IN CONCLUSION

May I say we all hope that before long this great war will be brought to a satisfactory ending. It will for many years leave its mark upon our industry, wider fields will be open, and we can look forward with confidence and assurance as to the future.

Thanks to the President.

Mr. G. Stevenson proposed a hearty vote of thanks to the President for his address, in which he had dealt with some of the most pressing problems in front of the gas industry at the present day.

Mr. Bell seconded, and said how glad they were to see Birmingham taking an active part in the affairs of the Association. He hoped the address would be followed by permission to visit the works which Mr. Chaney controlled. At Saltley there was a variety of plant; and the results they were getting there in many respects were to be emulated. The President had drawn attention to a number of problems which they must prepare themselves to face; for after the war they would not be able to go back to what they did in August, 1914. They saw that the Government were forming all kinds of Committees so as to investigate various questions; and he was glad to know that the gas industry was not going to lag behind. Mr. Chaney mentioned the part that women were playing to-day in different industries; and he (Mr. Bell) could fully corroborate their usefulness in gas-works. In Derby, they could not have maintained their position without the assistance of women labour. Of course, the women required training; but if this was thorough, it was wonderful what results they could attain. Turning to other matters, he felt that, if they were going to get from their men the results they were entitled to, they would have to have a different method of payment. It would behove all works to adopt a system of profit-sharing or some premium bonus plan; but he hoped that profit-sharing would begin at the top and go right down to the bottom. What was of special interest to him was the experience with regard to the Cooper coal-liming process. Some years ago, Mr. Paterson, of Cheltenham, experimented with it; and the question was then brought before the Association. But the difficulty that was felt was the deterioration of the coke. Though the figures quoted by the President certainly showed considerable benefits in ammonia and cyanogen content, he would like to know what the result was with regard to the coke. Was it found that, by adding 2 p.ct. of slaked lime to the coal, there was any deterioration in the quality of the coke, which was a very important matter at the present time? Coal was not so good as it used to be; and even a small percentage of lime, he was afraid, would add to the difficulties.

The President apologized for the briefness of the address, and for any matter in it which might not be of general interest. He was, however, rather an enthusiast on producer gas; and so perhaps they would pardon him for having introduced it. At Saltley, he said, they had two carbonizing installations—coke-ovens and producer gas and inclined retorts. At Windsor Street, there was the Woodall-Duckham system, and at Nechells "intermittent" verticals. If the members would like to inspect the various plants, as Mr. Bell had said, possibly they could this year have a summer meeting again, which, on account of the war, they had not had for the past few years. His Chairman and Committee would be only too pleased for the members to see what there was to be seen in Birmingham, and to give them a very hearty welcome. Mr. Bell had referred to the liming process. He was quite right in assuming that the lime was rather a detriment to the coke. It was not a detriment actually to the burning of the coke; but people were rather conservative on the question of the little white specks in it. It was found to be better for combustion in the stoves; for the small amount of lime helped to brighten the fire up. Why, he was not chemist enough to be able to say. The various consumers of the coke, however, certainly took slight objection to it. But in these times they wanted to do all they could to increase the ammonia in the gas; and they thought it would be worth while to revive some of the experiments of the past. Various suggestions had been resurrected; but he did not think they had arrived at any really definite conclusion on the point.

A Summer Meeting.

Mr. Bell said that, in order to test the meeting, he would propose at once that they very cordially accept the kind invitation of the Chairman and members of the Gas Committee and Engineers of the Birmingham Corporation Gas Department to visit their works some time during the summer. It would be an exceedingly interesting visit.

Mr. W. M. Valon (Stafford) seconded the motion, which was unanimously agreed to.

Representative on the Council of the Institution.

On the proposition of Mr. C. H. Webb (Stourbridge), seconded by Mr. Copp, the President was elected as the district representative on the Council of the Institution of Gas Engineers.

Representative on the National Gas Council.

Mr. G. Stevenson proposed that the President be elected their representative on the Executive of the National Gas Council. He said this was the first time they had been called upon to elect such a representative. Towards the latter end of last year, the National Gas Council circularized the District Associations suggesting that, as many problems of national importance would probably crop up in the near future, they would like the active co-operation of one member representing each District Association. It was of great importance that they should be so represented; and the President was the right and proper person to do it. Many of the members were writing to the National Gas Council; and it would be necessary that they should let their representative see a copy of any future communications, so that he could take up at the Committee meetings any matter referred to. It seemed to him that the National Gas Council, being the accepted medium

through which all national authorities were approaching the gas industry, would become a very important body.

Mr. VALON, who seconded, said it was a pity that they should have to have a National Gas Council separate from the parent Institution; but provided that they secured direct representation on it, they would have an opportunity of putting forward anything they themselves might think of national importance.

The PRESIDENT remarked that he thought the National Gas Council would, during the coming year, have a great deal of work to do.

The motion was agreed to.

THE VOLUME OF ASSOCIATION REPORTS.

The HON. SECRETARY proposed that copies of the "District Associations Reports" be sent to all members not in arrear with their subscriptions. He said that, in making this proposition, he would like to mention that if anyone who received more than a single copy would communicate with him it would be possible to save some expense. The price for the present year would be 5s. 6d. as hitherto; but this would not be the price in the future. There would be a substantial advance, which, of course, they must expect. There had been a suggestion that the copies might be bound in paper covers; but this, the Publisher pointed out, was open to some objection.

Mr. A. T. HARRIS (Market Harborough), who seconded, suggested that any overlapping was caused by members having joined more than one District Association. It would be a pity, for a slight saving in cost, to sacrifice the good cloth cover which they saw on their shelves to-day. He hoped they would maintain the quality, even at an enhanced price.

Mr. BELL supported the proposition, and hoped that a copy would be sent to each member. There was a certain amount of overlapping. Mr. Berridge was in the same position as himself, of receiving more than one copy; but Mr. Berridge could hand the duplicate to one of his assistants. If the Association began to curtail the number of copies they ordered, the price would probably still further advance. He did not know of any work published from year to year that contained so much useful information as the combined "Proceedings" of the District Associations; and it would be a great loss to the members, not only of their Association, but of the other Associations, if there was any break in the continuity. He hoped they would order the full number.

Mr. COPP thought it would be a pity for it to go forth from the meeting that they grudged a few shillings in this connection; seeing that they were so deeply indebted to the Publisher of the book.

TAR DEHYDRATING PLANTS.

The HON. SECRETARY said he had recently received the following letter from the Secretary of the National Gas Council; and, as it dealt with a commercial matter, he passed it on to the Secretary of the Commercial Association. It had been before the Committee, who decided that it was a matter which affected the general body of members, and so should be submitted to the meeting.

> I am instructed to inform you that the Council recently communicated with the Ministry of Munitions pointing out that they had been approached on behalf of several gas undertakings who some time ago invested in tar dehydrating plants which were now idle in consequence of the restriction placed on the use of tar for road purposes.
>
> The Council suggested that the Government should subsidize gas undertakings who can show they are suffering a loss of revenue in consequence of the restriction. The following reply was received from the Ministry:
>
> . . . "I am directed to inform you that this Department could not agree to pay compensation on account of raw materials not being available for treatment in plants erected by gas-works at their own risk.
>
> I am to point out that at many works tar dehydrating plants have been put to profitable use by their conversion into stills for oil-washing. Possibly some of the undertakings which have approached the Executive Committee of your Council have overlooked the opportunity of utilizing in this manner their plants which have been thrown out of action on account of a reduced demand for dehydrated tar."
>
> The Council would be glad if you would kindly place this correspondence before your Commercial Section, and obtain the views of your members and further facts and figures with which we can again approach the Ministry of Munitions.
>
> Should you be able to quote instances showing (in particular cases) the usual yearly revenue from the sale of tar, and the estimated amount of loss caused by the restricted sale of tar for road purposes, these will be of great use.
>
> The Council are informed that in certain cases there are very heavy stocks of tar which cannot be disposed of. In view of the fact that the Ministry of Munitions receive monthly returns of the stocks of tar at all gas-works, and are admittedly anxious to have as much as possible distilled, it is difficult to understand why they are allowing such stocks to accumulate. It would be interesting to know if there are any abnormally large stocks in your district, and if there are special reasons why the tar cannot be sent to distillers in these cases.
>
> The Council will be glad to have full replies to the above points, and in general your views with regard to the position as it affects your district.

Mr. G. STEVENSON said the history of this letter was that the Eastern Counties Gas Managers' Association had sent a communication to the National Gas Council informing them that the Road Board had very largely, and in some cases altogether, discontinued licencing the sale of road tar; and many of the gas undertakings throughout the Eastern Counties had depended greatly upon dehydrated tar for their revenue from this product. Their co-operation was therefore asked for, if similar cases existed in the Midlands, with a view to getting some help from the Ministry of Munitions. He rather gathered that in the Midland Association the same conditions did not obtain; but if there were any cases, and they were reported to the Secretary or to the Secretary of the Commercial Association, they ought to be sent on, so as to help the Eastern Counties Association. The suggestion was made that the tar dehydration plants should be applied to benzol washing; but there were two sides to this question from a practical standpoint.

Mr. BELL remarked that in his own case they were almost blocked-up with tar, because the distillers could not deal with it at the present time. He did hope that they would put pressure on the Road Board, through the National Gas Council, to induce them to issue permits and also to subsidize the use of tar-spraying for road purposes. He had it on the authority of the Borough Engineer at Derby that the spraying of tar and the washing of roads by means of refined tar was the means of greatly increasing the life of the roads. At the present time the roads had an enormous amount of motor traffic on them; and if this treatment of the road surfaces with tar was suspended, even for a year or two, it would be a retrograde movement, and one that would cost the ratepayers eventually thousands, or perhaps millions, of pounds. On this ground alone, they ought to point out the importance of continuing the treatment of the surfaces of the roads. Many districts, too, were now inundated with clouds of dust from motor traffic. This was another reason. Then, also, the tar distillers at the present time were at their wit's end to know what to do with pitch; and if this tar which was usually dehydrated and used for road surfaces was to go to the distillers and pitch was further accumulated, the difficulty would become still greater. It was said that they might convert their plants to oil washing; but many of them, at the request of the Ministry of Munitions, had put up special benzol recovery plants. Now they had their tar dehydrating plants in addition; and it would be a great hardship, not only to small works, but to many of the larger ones, if this prohibition was not removed. It was most unfair that the industry should be treated in this manner; but it was only in a line with what they were getting from the Government. [Hear, hear."] They were asked to help, first in one manner, and then in another; and in return they were getting repressed and pushed back in all kinds of ways. There was no industry he could call to mind that was being penalized by the war as the gas industry was to-day; and there was no industry that had done so much to forward the war as the gas industry had done. Therefore, as a matter of right, they claimed that this question, along with other questions, ought to be fully ventilated. They had been taking all these things sitting down—with just a mild protest. It was about time that they rose up, and said: "Unless you do certain things, you will have to take the responsibility." Many of them to-day had their tar-wells full to overflowing; and there was no reason why the Road Board, who raised the money from the ratepayers, should withhold the grants. He hoped that a very strong protest would be sent to the Road Board with respect to their action. ["Hear, hear."]

Mr. COPP said he had just completed a tar dehydrating plant; and having already a benzol plant, and not being permitted to employ the tar plant for making prepared tar, he had to think of another use for it. He believed he had found extremely useful work for the plant. One well-known method of dealing with naphthalene troubles was by washing with creosote. When they washed with creosote for benzol, they got it full of naphthalene; and when it was saturated, the naphthalene went forward, and there was more trouble when recovering benzol than when not doing so. If they could not use their dehydrating plant for tar, he suggested that they should periodically pass their creosote oil through it, and put up naphthalene settling-tanks. They would then get their naphthalene in the settling-tanks instead of in the mains. He quite realized that this did not get them out of the difficulty.

Mr. E. W. SMITH (Birmingham) said that they had a tar dehydrating plant; but fortunately for them, the Borough Surveyor had got his licence, and they had permission to make if necessary 2000 tons in the year. He did not think it would be wise to take a "whole hog" view of the matter, such as Mr. Bell suggested. There were limits to it. The requirements for fuel oil from tar were much more important than the loss to the gas-works of tar dehydrating plants; and he thought they should only push the case in so far as the Government could not make use of the tar. If there were proved to be large stocks of tar in various gas-works not taken by the distillers, these should be employed for road purposes; but they should not use the tar for the roads if it would in any way restrict the production of oil for fuel purposes. This should be included in any demand made that tar should be used for Road Board work. As to the use of dehydrating plants for oil washing and so on, they could be employed in this way; but inasmuch as the Government were not extending appreciably the washing of coal gas for benzol and toluol, it appeared that there was not much inducement for providing a very much increased supply. There seemed to be about as much benzol and toluol as was required at the present time. Stocks were ample, so far as he could gather. The matter would be complicated, too, if they had to provide a lot of other plant of which there was a shortage.

The PRESIDENT said he did not know that they could very well render any assistance to those gentlemen who were in the awkward position of having tar dehydration plant and not being able to use it. It appeared that there was some relief to be found, from the fact that recently the Road Board had stated that, in view of the unsuitability for road purposes of the tar complying with the specification laid down in their order dated Dec. 31, 1917, they had agreed that, until further notice, tar might be purchased under permits issued complying with the following specification: Dehydrated or prepared tar which, on being distilled to a medium soft pitch, shall not yield more than 30 p.ct. of tar oils. There was a gleam of satisfaction here; but even with 30 p.ct., the tar would still when cool be too thick to manœuvre. He would suggest, as a means of helping one another, that they should have some statistics got out as to the various tar dehydration plants connected with their particular Association, and ascertain if there was any difficulty, so that they could report to the proper quarter.

Mr. G. STEVENSON proposed that all members who were in any difficulty with regard to tar should send on their troubles to the Secretary, in order that they might be tabulated by himself and the President. The President would then be able to present the case of the Midland Association to the National Gas Council.

Mr. BELL remarked that they could give a list of the works which had gone to the expense of providing tar dehydration plants. They were assured by the local authorities and the Road Board that if they put up these plants there would be a demand for the tar. During this time of war, when all kinds of difficulties were on them, it did seem hard that their works should be blocked-up with tar because of a reversal of this policy. As had been pointed out, the suggestion made was "just a get out," because he believed there was plenty of benzol at the present time. In fact, he understood the Government said they were not going to extend the extraction of benzol to further gas-works at this stage.

The resolution was carried.

Suggested Refund of the 12½ p.ct.

Mr. Berridge said he gathered that some of the large iron-works were getting a refund of the 12½ p.ct. He thought the Association should make representation with a view to getting it allowed to gas-works as well as to some of the iron-works.

The President: Is it a refund by Government to the ironworks?

Mr. Berridge: Yes, a refund, because they have been put to this extra expense. The gas industry have also been put to the same extra expense by an order of the Government; and we feel the gas-works ought not to bear it.

Mr. Bell said he would second that. This 12½ p.ct., which had been forced upon them by the Government, should be refunded. The pig iron people were having it refunded to them; and other industries were getting it back out of their excess profits. With gas companies, on the other hand, it might mean that their dividends would possibly come down ½ p.ct. It was a very unfair position. Though they were making much larger quantities of gas, they were realizing less profits, because they were being penalized. They never had a stronger case than they had now with this.

Mr. Berridge: We should ask the National Gas Council to make the representation, as well as ourselves.

The President said perhaps the best way would be to approach the National Gas Council, with a view to ascertain on what grounds the 12½ p.ct. was refunded to the iron-works. They would then have quite as strong a case for the gas-works.

Agreed.

The Wages Award.

A brief discussion then ensued upon the recent wages award, some particulars as to which were given by Mr. G. Stevenson.

Mr. W. C. Jones said he would like an explanation of what the 12½ p.ct. bonus meant.

Mr. Harris asked what was the position of uncertified gas undertakings.

Mr. Stevenson said the 12½ p.ct. was payable on a man's total earnings—overtime and everything put together. It did not alter his ordinary wages; but the 12½ p.ct. was on the total earnings. It was obligatory on all certified undertakings, though many had had no demand from any union or from their men. There was no obligation whatever on any uncertified undertaking to do anything.

Mr. Bell said some of them had not only granted advances in wages, but had made considerable reductions in tonnage dealt with by the men and other conditions. Now the men were getting this further substantial advance, the concessions they had made with respect to weight, &c., would be withdrawn. This was an important point.

Mr. Stevenson said this was how he understood the matter.

Mr. Bell hoped they would insist upon the same amount of work per man—he was referring to stokers—as in August, 1914. This, to his mind, was the meaning of the award.

At the conclusion of the business, those present were the guests of the President at tea.

Women Workers in the Industry.

A subject which will interest everybody is that dealt with in a special issue of "A Thousand-and-One Uses for Gas"—namely, women's work in the gas industry. In the preparation of the article, the idea of the British Commercial Gas Association has been to help such gas administrators as may not yet have reached the utmost limit in the adoption of every possible means for saving and for replacing fit men by women, by making clear to them the numerous ways in which women are taking the place of men in gas-works and offices. Careful readers of the "Journal" will have already made themselves acquainted with what is being done by women in this direction; but whether or not the subject has become a familiar one to them, they will enjoy the first-rate series of illustrations by which the article is accompanied. Of these photographs there are over sixty—taken in the works of the Gas Light and Coke Company, the South Merropolitan Gas Company, the Birmingham Corporation Gas Department, and the Edinburgh and Leith Gas Commissioners—and they depict both indoor and outdoor operations of almost all kinds pertaining to a gas undertaking. In addition to retort-house work, for example, there are occupations as far separated as those of a blacksmith's striker and a gas-fire enameller, coke-wheeling, and meter-house attending.

Evening Star Lodge, No. 1719.

The Installation Meeting of the Lodge was held on Wednesday last week at Mark Mason's Hall, when the outgoing Master, W. Bro. Archibald P. Main, installed his successor W. Bro. Fred. J. West, P.M. of the Northern Star Lodge, No. 3053. After the report of the Standing Committee and the accounts for the past year had been presented and adopted, the routine business of the lodge was disposed of before the new officers were invested. The full list of these brethren for the year 1918-19 is as follows:

W. Bro. Frederick J. West, P.M. 3053	W.M.
W. Bro. Archibald P. Main	I.P.M.
W. Bro. H. W. Packham, P.P.G.D. (Surrey)	S.W.
Bro. Corbett W. Woodall	J.W.
W. Bro. Arthur Valon, P.M., L.R.	Chaplain
W. Bro. F. W. Cross, P.M., L.R.	Treasurer
W. Bro. Walter T. Dunn, P.M., L.R.	Secretary
Bro. Alfred C. Beal	S.D.
Bro. Charles Clare	J.D.
W. Bro. J. Fred Wicks, P.M.	Dir. of Cer.
Bro. John F. Simmance	Organist
W. Bro. R. W. Foster, L.R.	I.G.
Bro. Frederick L. Schofield	Stewards.
Bro. Frank Jervis	
Bro. Frank West	

THE POWER BYE-PRODUCT PROBLEM.

Before the Society of Engineers, on Monday of last week, Mr. T. Roland Wollaston, of Manchester, who has done a considerable amount of research on coal utilization, read a paper in which he surveyed the present position of the power bye-product problem in the light of the recent report of the Coal Conservation Sub-Committee of the Ministry of Reconstruction. He dealt with the matter solely from the engineering and technical points of view, and discussed the *pros* and *cons* of the gasification of coal in conjunction with the super-electric power stations which the Sub-Committee recommended. His general argument was that the thermal efficiency of power plant is only one of many important considerations for analysis, and not necessarily the most important; and that there could not be any one scheme fitted for all districts and all conditions.

From recent figures, he showed that, in a total cost of 0·55d. per unit, the fuel cost was only 0·24d., or 44 p.ct. A saving of 10 p.ct. in fuel, therefore, arising out of higher thermal efficiency, represented only about 4½ p.ct. saving in the cost of the unit. Advocates of super-stations might, with some justice, argue that large units also led to proportionate reduction in charges for capital and labour. While this might be true for steam-turbines, with the internal combustion engine it was different. Gas-engines cost considerably more, *per se*, than steam-turbines; and the gain in thermal efficiency was counteracted by extra capital and maintenance charges. Moreover, it was questionable whether the extra thermal efficiency which was claimed for the internal combustion engine really existed.

Dealing with gas-firing of boilers, the author did not think it has yet had fair play, in that it has almost always been carried out in boilers specifically designed round coal grates intended for direct firing. Even in such cases, the ease and consistency of management must appeal to every engineer. Tests conducted by the author on Lancashire boilers, extending over many days, with producer gas of none too regular qualify, and with burners now considered crude, had shown wonderfully consistent results; and there was only one man attending to nine boilers. Dr. Bone, also, had shown that 90 p.ct. or more gas efficiency could be regularly obtained; and though the author, on the one point on which he felt qualified to judge (intense local temperature and vagaries of feed water), was not greatly in love with Dr. Bone's design, he had the conviction that efficiencies equal to, or approaching, this would readily be shown, as soon as practical makers seriously tackled the problem of boiler design solely and wholly for gas firing. The essence of the matter was that, in firing with gas, it was possible to maintain substantially perfect chemical combustion. With ordinary gas producer efficiency of 70 p.ct., there was an over-all efficiency of 63 p.ct. for gas firing, against (say) 70 p.ct. for the direct-fired boiler. In other words, a 12 p.ct. greater coal consumption for the same steam output; the gas-producer coal being often of a much poorer and cheaper quality.

For purely power supply purposes, bye-products, important as they were, must always be secondary to the highest possible yield of British thermal units convertible into electrical energy from the fuel. An attempt was made in the paper to co-ordinate ideas from this view-point in the following estimates of gross receipts from a ton of coal under the various processes; 12,000 B.Th.U. per pound of coal being assumed in each case. While pointing out that the method is original, the author also admits that it is elementary and superficial, and that, to be complete, the summary should have included raw fuel, capital, labour, and maintenance costs, its charges and the like. The chemical and physical nature of the coal would be important factors as affecting yields of each specific bye-product. The gas yield from each system is translated into electrical units on the basis that 20,000 B.Th.U. will produce one unit, and that the fuel cost is one-sixth of a penny.

Estimates of Gross Receipts from One Ton of Coal Consumed.

(*a*) *Town Gas.* (Mr. W. W. Woodward, Gas Engineer to the Salford Corporation.)

	£	s.	d.
12,000 c.ft. of 500 B.Th.U. gas = 300 units, at ⅛d.	0	4	2
10 cwt. of coke, at 15s.	0	7	6
25 lbs. of sulphate of ammonia, at 1½d.	0	3	2
11 gallons of good tar, at 1·3d.	0	1	2
	£0	16	0

(*b*) *Coke-Ovens.* (Mr. Lloyd, of Simon-Carvés, Ltd.)

	£	s.	d.
6000 c.ft. of 475 B.Th.U. gas = 143 units, at ⅛d.	£0	2	0
16 cwt. of blast-furnace coke, at 20s.	0	16	0
30 lbs. of sulphate of ammonia, at 1½d.	0	3	9
3 gallons of crude benzol, at 9d.	0	2	3
4 gallons of good tar, at 1·3d.	0	0	5
	£1	4	5

(*c*) *A Low Temperature Distillation System, plus Producers.* (Mr. J. Drummond Paton.)

	£	s.	d.
80,000 c.ft. of 120 B.Th.U. gas = 480 units, at ⅛d.	£0	6	8
12 gallons crude oil, at 4d.	0	4	0
2 gallons benzol, at 1s.	0	2	0
70 lbs. of sulphate of ammonia, at 1½d.	0	8	9
	£1	1	5

(*d*) *Mond Producer System.* (Power Gas Corporation.)

127,000 c.ft. of 120 B.Th.U. gas = 871 units, at ¼d.	£0	12	1
74 lbs. sulphate of ammonia, at 1½d.	0	9	3
7 gallons of poor tar, at 1d.	0	0	7
	£1	1	11

(*e*) *Proposed Improved Mond Plant.* (The Author.)

156,800 c.ft. of 120 B.Th.U. gas = 1078 units, at ¼d.	£0	14	11
90 lbs. of sulphate of ammonia, at 1½d.	0	11	3
1 gallon crude benzol, at 9d.	0	0	9
4 gallons crude oil, at 3d.	0	1	0
	£1	7	11

(*f*) Direct firing to boilers, 1344 units, at ¼d. £0 18 8

Brief descriptions were then given of the Mond, Maclaurin, and Paton processes. The Moore recovery producer was described as an effort to eliminate the economic shortcoming of the Mond producer, that 18 p.ct. of the total fuel is required to generate blast steam. Mr. Moore, by surrounding the upper part of his producer with a water-jacket (in effect a boiler), succeeds in generating by the waste heat of outgoing gas a substantial portion of the blast steam necessary for ammonia recovery equal to Mond; and by making his producer oval instead of circular, thus reducing the thickness of the mass of fuel therein, he also reduces the hot-zone temperature by direct radiation.

The author's modification of the Mond process referred to in (*e*), is an attempt to carry this improvement a step further. A circular producer is proposed, surrounded by an annular jacket or boiler. Centrally within the producer is a hollow core, through which the air blast is introduced from below, taking the course indicated by the arrows. This central core, traversing the hottest fuel zones, becomes very hot; and steam from the jacket-boiler, together with atomized hot water, is forcibly introduced at a point where it flashes into steam and mingles with the already superheated air blast on its way to the grate. Heat is thus abstracted radially both inwards and outwards from the narrow annular fuel-bed; and it is believed the effect of the Mond plant (so far as good ammonia yield is concerned) will be secured without any steam being borrowed from outside sources. This design aims at still further practical objects—for example, the utilization of almost any fuel, with separate recovery of a portion of the volatile products, and a rich producer gas. The results, however, have still to be demonstrated on a working scale.

The author comes to the following conclusions:

(1) That under certain conditions—mainly those of utilization of cheap inferior coal, demand for nitrogen products, and high load-factor—the installation of producer recovery gas plant as an integral portion of large electricity generating stations offers promise of large rebates on current cost, and important conveniences in handling and maintenance.

(2) That this particularly applies when large quantities of electricity are needed in nitrogen fixation, electrolytic, or metallurgical undertakings.

(3) That, in connection with low-temperature distillation systems for fuels rich in volatile products, and in coke-oven plants, blast-furnace installations, and the like, producing surplus gas, electrical generating stations capable of using this surplus gas to the utmost, and acting as feeder stations to a larger system, should be put down; but, as in plants of these types the gas is really a minor bye-product, these are suitable for consideration only as incidental to a large electricity scheme.

(4) That, in view of the increasing use of electricity and the incandescent system of gas lighting for domestic lighting, the extended use of gas for domestic cooking and heating, and the slow progress of electricity in these last services, the steady conversion of town-gas systems for higher yield of bye-products and for distribution of large volumes of low-grade heating gas, is desirable.

(5) That, having in view the afore-mentioned possibilities of gas-recovery systems in relation to the generation of cheap electricity and the proper use of coal, existing electrical stations provide excellent opportunities for trial and demonstration.

(6) That the assumed demand for semi-coke or like smokeless fuel for domestic purposes is problematical.

(7) That in any system involving distribution of coke or semi-coke for electrical generation the loss of sensible heat entailed between discharge from retorts and shipment is sufficiently important to be regarded.

(8) That against this, the distribution of "low-grade heat" provides an attractive idea for consideration as an argument in favour of smaller local stations.

DISCUSSION.

Mr. Michael Longridge (President of the Institution of Mechanical Engineers) said the time of the large gas-engine might come; but he did not think it had come yet. His experience had been that the interest on, and repayment of, capital in the case of the gas-engine installation was usually so much higher than with the steam-engine as to swamp any advantage to be obtained from an increase of the thermal efficiency from 20 p.ct. in the case of steam to 30 p.ct. with gas.

Mr. W. H. Tookey hoped that steps would be taken to prevent the undue export of coal in the future as a result of the greater economies that were to be looked for at home through the exertions of British engineers. In his opinion, insufficient attention had been given to gas production. There had been a gradual improvement in gas-producers ever since the original Mond plant, though whether or not Mr. Wollaston's design was likely to be successful had yet to be proved. The improvement of gas-producers had suffered from want of a national laboratory, in which new designs could be tested. Capable men had given a large amount of time and consideration to the very complex problems connected with the generation of gas power. There had been no combination of talent; but often there had been commercial rivalry which had not produced the greatest technical efficiency. With regard to the fourth conclusion in the paper, as to the desirability for the steady conversion of town gas systems for higher yield of bye-products, and the distribution of larger volumes of low-grade heating gas, it might not be known generally that there was a definite movement in this direction at the present time. Unfortunately, the requirements and limitations of gas companies under their statutory powers made it impossible for them to experiment. They had been obliged to distribute gas of a certain definite calorific value; but from the knowledge that had been gained during the past few years, it was being accepted with more and more unanimity that it would certainly pay gas companies, and individual users of gas, not to strive after a high calorific value of the gas, but to pay attention to the proper utilization of every British thermal unit that it was possible to get at the mouth of the burner in which the gas was consumed. This had a very great bearing upon boiler firing.

Mr. H. F. Bailey (Manchester) said it was known that there was at the present time in this country a shortage of nitrogen products. This was principally due to shipping difficulties; and the probability was that after the war the shipping position would for some time be difficult. Therefore it was highly probable that in the future we should have to use a great deal more of our sulphate of ammonia production than in the past. With a view to getting back again after the war as soon as possible into a prosperous condition, intensified production would have to be undertaken; and to this end, a very large fertilizer campaign was being prepared. The question of power production not only concerned the greatest number of heat units, but the production of large quantities of sulphate of ammonia. Experiments were now being made with vertical gas-retorts by the introduction of steam, which was really a modification of the idea put forward by Mr. Wollaston. The vertical retort on being charged with coal gave off a rich gas. After the bulk of this had been evolved, steam was passed in at the bottom, which increased the ammonia yield, and really turned the vertical retort into a producer. So far, this had given very satisfactory results, and had enabled some gas-works to keep up their production. These results were very encouraging, and seemed to show that some form of producer might work out to be the most economical and most efficient method of using fuel.

Mr. W. T. Bottomley regarded 90 p.ct. efficiency of a gas-fired boiler as high, especially when using Mond gas. On the other hand, 70 p.ct. for a coal-fired boiler was too low. As compared with steam, he had not been able to make Mond producer gas pay; and from the investigations he had made, it appeared that low-temperature carbonization would pay better, though very few people seemed to give reliable figures for this.

Mr. F. G. Fogg, replying to Mr. Bottomley on the efficiency of gas firing, said the Bone gas-fired boiler was now working quite satisfactorily commercially, giving efficiencies of from 92 to 95 p.ct. It had got past the experimental stage.

Dr. J. H. Harker (of the Munitions Inventions Department of the Ministry of Munitions) said the Nitrogen Products Committee had now arrived nearly at the end of their labours. It had been found necessary to subdivide the inquiry into bulk power supply into a number of committees and sub-committees, and to investigate the many problems *ab initio*. One aspect of this was the appointment of a Sub-Committee to investigate the question of gas-firing as distinct from coal-firing, under the chairmanship of Mr. W. R. Cooper. This Committee would consider whether it would be an advantage to gasify particular coals in a main producer and put the gas straight into a boiler or a gas-engine, or whether it would be better to carry out at an intermediate stage low-temperature distillation, and burn the resultant coke under a steam-boiler. Another question to be considered by the Sub-Committee would be how many tons of coal dealt with in various ways would be required to replace a ton of coal put direct under a steam-boiler. He did not think the author had paid sufficient attention to the point that more coal had to be put through a gas-producer than under a boiler to produce the same number of thermal units. It was rather misleading to start with a ton of coal in each case. The whole question from the power production point of view was how many thermal units were obtained from a ton of coal.

Mr. W. B. Esson (the Chairman) said the question of forming gas in a producer and firing the boilers with it, was one which depended upon the cost of coal.

Mr. Wollaston, in his reply, complained of the attitude of the various Committees who were dealing with this matter. The Committees spoke of starting afresh to investigate these problems; and yet there was a vast amount of information available, which the Ministry had not made full use of.

The proceedings then terminated.

Production of Home Fuel Oil.—The Minister of Munitions, in agreement with the Secretary for the Colonies and the Petroleum Executive, have appointed the following Committee to inquire into certain matters relating to the production of fuel oil from home sources: The Marquis of Crewe, K.G. (Chairman), Colonel A. Stirling, M.P., Major Godfrey Collins, M.P., Engineer Vice-Admiral G. G. Goodwin, C.B. (Engineer-in-Chief of the Navy), Sir Richard Redmayne (representing the Controller of Coal Mines), and Sir Lionel Phillips, Bart. (representing the Ministry of Munitions). The Secretary is Mr. G. C. Smallwood (Ministry of Munitions). The reference is: "To consider the report which has been rendered by the Petroleum Research Department on the production of fuel oil from home sources, and to advise to what extent and within what time it should be possible under present conditions to carry out the proposals made in this report, and to consider the steps which have been taken by the Ministry of Munitions in this connection."

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Coal and Gas Rationing.

Sir,—I have read with much interest your editorial remarks and the letters of various correspondents on the above matter.

To obtain the proper perspective for the formulation of any sound policy, it is necessary to clearly envisage the whole of the contending factors. In the present problem, the need is obviously to obtain the maximum saving in railway transport with the minimum of inconvenience to the public and the minimum loss of those bye-products which are essential for munitions and agriculture.

When coal is used for household purposes, all the valuable bye-products are lost, and *the rationing of household coal should therefore have been the first step in any programme of economy.*

For the sake of the benzol, toluene, tar, and sulphate of ammonia they recover, all gas-works should be encouraged to sell gas up to at least the limit of their existing producing capacity; and the necessary coal to do this should be readily forthcoming. Once they reach this point, a reasonable rationing scheme would assist them to keep their output within the required limits. Many gas-works have already reached such a point; and to them the present order must, if properly worked, prove of considerable benefit.

I am not at all in agreement with the view that a rationing of the coal supplied to the gas-works would be the preferable way of dealing with the problem. Many companies have for many months past consistently appealed to their consumers to be more economical; but the only result has been that the gas consumption has steadily and very seriously increased.

Once the limit of supply is reached, the only means open to the management for checking consumption is to reduce the pressure in the mains; and this inevitably means inefficiency and dissatisfaction all round. A Board of Trade Order with penalties for any glaring breach of the conditions is much more likely, in my opinion, to effect the desired economy, and to keep the consumption within the capacity of the gas-works.

To revert to the broad principles of the main problem, however, it seems that, to effect the necessary saving of railway transport on intelligent and logical lines, and having due regard to the contingent national requirements, a policy somewhat on the following lines is necessary:

(1) All coal for household purposes should be very strictly rationed.
(2) Due regard should be paid in such rationing to the use of gas coke for household purposes.
(3) No district should be rationed for gas until the full producing capacity of the local gas-works has been reached (a more drastic rationing of household coal could well be enforced in such districts).
(4) All towns in which the gas-works have reached their full producing capacity should be rationed on the lines of the present order, although preferably without such a considerable reduction in the amount of gas to be used.
(5) Before any general *reduction* in the gas ration is ordered, the coal ration for household purposes should be everywhere reduced to an absolute minimum.

While the above seems to me to be a reasonable and logical policy, especially having regard to the national interests involved, it does appear to me that gas undertakings should loyally, and by every means in their power, endeavour to faithfully apply the provisions of the present order as it stands. By so doing, they will be in a much stronger position to suggest to the Coal Controller or the Board of Trade the lines along which they as an industry with the national welfare at heart consider the present order requires modifying and amplifying.

Philip G. G. Moon, Acting General Manager.

Bournemouth Gas and Water Company,
April 11, 1918.

The Importance of Coal Gas in Wartime.

Sir,—My letter in last week's "Journal" by chance appeared contemporaneously with the Government's offer of a £2000 prize to assist them out of their apparent anxiety in regard to the provision of fuel oil for the Navy. In other words, the Government scents danger ahead; and yet the chief source of the fuel oils—*i.e.*, crude coal tar—is being lessened by the altogether uncalled-for rationing of the coal supplies to gas-works. Every ton of coal carbonized yields about 2½ gallons of fuel oil, or 25 p.ct. of the crude coal tar formed, and by far the major portion of crude coal tar made at gas-works and coke-ovens is now *completely* distilled at the tar-works. Dehydrated tar now manufactured only forms a small percentage of the total tar distilled; but no doubt the Government's idea is to make use of partially distilled tar before it reaches the pitch stage, and thus keep the large amount of pitch contained in dehydrated tar in a liquid state, mix it with mineral oil, and burn it in specially adapted burners.

If the inventive genius of the country will solve the difficulty by forming a satisfactory fuel oil suitable for Admiralty use by mixing petroleum oil with not less than 33 p.ct., it only shows how dependent the country is on the distillation of coal at the only works at which it can be distilled—namely, coke-oven works and gas-works—and how highly necessary it is that these first-class vital industries to a country determined to win the war should be given the necessary and the best brands of coal to yield the highest results in tar, and when it is abundantly necessary that gas-works should, as I stated in my letter last week, be provided with enough first-class coal to make as nearly as possible 100 p.ct. of *good rich* coal gas wherever possible. In most gas-works this is possible in the summer time, because even although many gas-works in winter time have not sufficient plant without the aid of the water-gas plants, yet in the summer enough retorts are available to make 100 p.ct. of good rich coal gas. It is manifestly absurd, in the face of the needs of the Navy alone, to ration coals to gas-works and force them in many instances to make 30 to 40 p.ct. of "blue" water gas, which yields no fuel oils, deprives essential industries of coke fuel, and compels those industries to burn coal from which they cannot possibly derive any tar or any of the hundreds of useful products derived from gas-works—benzol, toluol, concentrated ammonia, sulphuric acid, sulphate of ammonia, tar oils, dyes, pitch, naphthalene, &c., &c.—all of which are vitally necessary to a country at war, and should be produced in as large quantities as is reasonably possible to protect the lives of our soldiers at the front and form a bulwark of national safety.

I am wondering if the Controller of Munitions Mineral Oil Production Department is aware that coal is being rationed to gas-works, and if the Government is really alive to the increased dangers it is incurring? I said in my letter last week that the present rationing of coal to gas-works is a gigantic mistake *for which we may have to pay dearly*. I can only think that my words are unfortunately coming truer sooner than anticipated. But, as I then pointed out, there is a very simple and easy way out, by the house coal being diverted to gas-works. I have since learnt from an important coal merchant that in the present slackness of the house coal trade, and the consequent inability to empty the house-coal wagons, the merchants would only be too glad of the opportunity to use their idle horses and vans to convey the coal to gas-works.

The rationing of gas is having the very opposite effect of its intentions to save coal and coal transport. A gas consumer who has always been careful to economize gas informed me last week that she intended using the coal-range instead of the gas-cooker for cooking on Thursdays and Fridays, as the only possible means of reducing the gas consumption by one-sixth; and no doubt many thousands of other gas consumers will follow her example unless sufficient gas is obtainable without incurring a fine. She has always hitherto used the gas-cooker, and has used one in the same house for the last 15 years; and only on very rare occasions of excessive cold has the coal-range been lighted. Yet, under the Household Coal Distribution Order, for this nine-room house the tenant is entitled to consume 12 ton 3 cwt. of coal annually. The tenant has never in the 15 years *consumed half this amount;* and the same applies, no doubt, in thousands of other cases. That is why I say the rationing of gas will have the very opposite effect to that intended, as it will drive gas consumers to use their coal-ranges, which will have to be fed with coal all day, and, consequently, use many more times the coal that would have been carbonized at the gas-works, and deprive the nation of all the valuable bye-products which could be derived from the coal used in the coal-range. The result will be that there will be a great deal more coal consumed, *increasing* the transport and labour required from pit to household, and, moreover, will create a quantity of ashes to be removed by the municipalities.

House coal should be rationed in the same manner as gas is now rationed—that is to say, the householder should be compelled to reduce coal consumption by at least one-sixth that in the previous year. What is sauce for the goose should be sauce for the gander. Several truck-loads of unscreened household coal delivered to a gas-works in London from Derbyshire yielded over 37 p.ct. of volatile matter and only 2·6 p.ct. of ash. Such coal as this should be used exclusively at gas-works, especially as there is no need to screen it. Brands of this description would soon begin to relieve the Government of their anxiety in regard to Navy fuel oil.

I am thoroughly against any wastage in the use of gas. I contend the present rationing of coal to gas-works is without question entirely against the interests of the nation at this critical period of the war, because *coal* gas is now the best friend the nation possesses, and water gas is really an enemy. There is not one industry mentioned in the schedule of protected occupations but which uses some product from the distillation of coal, and we must regard the Government's schedule as industries absolutely vitally necessary for the nation's safety. We must keep the Navy going at all costs. This can be substantially assisted by gas-works; and I should say, at a rough estimate, that by the present rationing of coal to gas-works the Navy is being deprived of fuel oil at the rate of about 5,000,000 gallons per annum, all of which could easily be avoided, and could be very substantially added to, if gas-works made as nearly as possible 100 p.ct. of *good rich* coal gas.

As the particulars of the Government's £2000 prize seem to have appeared only in the technical gas publications, it is well-deserved compliment to the gas industry; and in all probability a solution will be found. But what of the Navy meanwhile? Is it to starve of fuel oil?

"Cricket."

April 15, 1918.

The Lighting, Heating, and Power Order, 1918.

Sir,—I am forwarding herewith a specimen of a "Gas Ration Card," which we are sending by post to all our consumers. As you will notice [see *ante*, p. 93] this card gives particulars of the quantities of gas allowed to be consumed in the ensuing four quarters, to Ladyday, 1919, together with instructions for reading gas-meters.

It appears to me that the only way in which a consumer can make sure that he is not exceeding his allowance, is by frequent readings of his meter; and we are endeavouring to impress this fact upon our consumers by every means in our power.

Philip G. G. Moon, Acting General Manager.

Bournemouth Gas and Water Company,
April 8, 1918.

Burnley Gas-Works and the Wages Award.—The Burnley Gas-Works are not certified; but should the award recently given the National Federation of General Workers be made to apply to the departmental workers, it will mean an addition to the present wages of about £13,000, which is equivalent to about 4½d. per 1000 c.ft. of gas. The price of gas (having recently been raised 2d.) is now at the maximum allowed—3s.

REGISTER OF PATENTS.

Atmospheric Burners.—No. 9905 of 1915.

Hunter, C. M., of Lombard Street, E.C.

July 15, 1915. Accepted March 7, 1918.

This invention relates to atmospheric burners (for gas and other fuel of like physical nature) of relatively large capacity for industrial heating purposes (such as the heating of boiler and other furnaces), and wherein the fuel is used at high pressure—for example, in the burner described in patent No. 16,173 of 1912. The object of the present invention is to provide improved means for introducing and controlling the air supply, both as regards volume and temperature, and also to suppress or minimize the noise heretofore inherent in such burners.

Atmospheric gas-burners have heretofore been proposed, the patentee remarks, wherein a series of cones have been combined with a centrally disposed fuel-duct to form a series of air ports or passages, one in front of another, for supplying the air necessary to maintain combustion of the fuel, and wherein means have been provided for restricting or controlling the quantity of air passing through the passages, according to the character of the fuel supply.

According to his invention, use is made of a somewhat similar construction; but instead of having the cones movable with relation to one another, he makes them relatively rigid, and combines with them means of a character to constitute a continuous fuel-duct of substantially smooth bore and uniform cross sectional area, "whereby spaces or pockets, productive of eddies in the current, are avoided."

He arranges a series of fixed hollow cone frusta, one within the other, with their axes coincident and with spaces between them, constituting annular ports, and provides the duct or nozzle through which the gas issues with a sliding sleeve designed to pass through the central aperture of the cones in such a manner that one or more of the ports may be closed, according to the position of the sleeve, for the purpose of regulating the air supply—the sleeve at the same time serving to extend the fuel-duct.

For the suppression of noise, he encloses the air-ports and the gas-nozzle in a chamber at the rear of the front cone and the gas-nozzle; the chamber being adapted for connection to a pipe or conduit through which the air is supplied. Means may also be provided in connection with this pipe for heating or cooling the air supply.

Preventing the Choking-up of Gas Plant. No. 101,219.

Riedel, A., of Kössern, near Grimma, Saxony.

No. 11,574; Aug. 16, 1916.

During the dry distillation of coal, the patentee remarks, it frequently happens that deposits—consisting mainly of ammonium chloride, mixed, it may be, with ammonium carbonate—which are in the highest degree prejudicial to the proper working of the condensers are formed in the mains and other points of the apparatus; and "in order to avoid obstructions it has hitherto been usual to make use of wet processes, in which the ammonium compounds in question are carried away in a partially aqueous solution." According to the present invention, however, the method adopted is practically the converse, since it consists in "causing the whole of the nitrogen present to assume a form in which it can easily be precipitated in the condenser, and can consequently be separated at once in a comparatively pure condition, whereby the necessity for the somewhat complicated treatment of the ammoniacal liquor is at the same time avoided."

For this purpose the fixed nitrogen is converted into ammonium chloride, by the addition of chlorides to the material to be gasified. The temperature of sublimation of ammonium chloride is about 450° C.; and it is consequently quite easy, by means of fractional condensation, to separate it from the gases in a comparatively pure state, together with a small quantity of sulphur. All that is necessary to this end is to maintain the pipes leading from the retort to the condensing apparatus at a temperature somewhat above 450° C., and to reduce the temperature of the condenser itself to below 450° C., in order to ensure that only ammonium chloride and sulphur shall remain as a condensation product, in a state the degree of purity of which will vary according to the conditions prevailing.

The chlorides used, which are more particularly magnesium chloride or calcium chloride, should be thoroughly mixed with the charge in such proportion that the chloride corresponds to the quantity of free nitrogen in the coal.

It has already been proposed, the patentee points out, to add common salt to coal, in the proportions of 4 lbs. of salt to every ton of coal, after it has been placed in the retort for carbonization for the purpose of increasing the quantity of ammoniacal compounds; to coke lignite and other fuel in a furnace by the dry distillation of the fuel with the addition of 65 p.ct. of calcium chloride, 2 p.ct. of carbonate of magnesia, and 5 p.ct. of boric acid; and to treat a charge of coal in a furnace or kiln with chlorides of various kinds in the presence of sulphur compounds, air, and steam, for the purpose of obtaining cyanogen compounds, and nearly the whole of the nitrogen as ammonium chloride. It has also been proposed to obtain in the form of ammonium chloride practically all the fixed nitrogen contained in manure or other organic matter by adding to it an alkaline base (such as lime) and treating this with chloride of sodium or other chloride in a closed vessel at a temperature of about 300° Fahr. By the present invention, however, chlorides alone are added to the charge, and the whole of the nitrogen is converted directly into a definite homogeneous salt (chloride of ammonium), no other ammoniacal compound being produced; and the process is considerably facilitated by maintaining the pipes leading from the retort to the condenser at somewhat above the sublimation temperature of ammonium chloride, and the condenser itself at just below this temperature.

Automatically Exchanging Incandescent Bodies in an Incandescent Gaslight Arrangement. No. 110,346.

Svenska Aktiebolaget Gasaccumulator, of Stockholm.

No. 12,073; Aug. 22, 1917.

This apparatus is designed for automatically exchanging "mantles" in an incandescent gas light arrangement when a previously active incandescent body breaks. For this purpose, it has been proposed to employ a pin of a material which is melted or weakened by heat, and which co-operates with a stop that keeps the additional incandescent body in its place, but which is destroyed when played upon by the burner flame, so that the stop is released and allows the movement of the reserve incandescent body to the plane of the incandescent body which was previously active.

In apparatus according to the present invention the reserve incandescent body and its holder are carried by a frame, comprising a link-and-lever system, actuated by a driving device the action of which is controlled by the releasing device. The holder of the reserve incandescent body is moved in or out of engagement with the burner by means of a cam driven by the driving device.

Retorts and Methods of Working Them. No. 113,981.

West, J., of Southport, and Wild, W., of Blackpool.

No. 17,714; Dec. 9, 1916.

This invention relates to retorts of the horizontal or inclined type, in which the material being carbonized does not pass into, and travel through, the retort by gravity. The object aimed at is to provide for continuous carbonization in retort settings which "shall give high gas yields per unit weight of material carbonized and shall produce a coke bye-product of good quality."

The patentees claim to have found by investigation and experiment that to obtain satisfactory results it is necessary that the retorts be maintained practically fully charged at the charging end throughout normal working, be of flattened cross section, and taper outwards towards their delivery ends. It is also necessary that the coal, immediately it enters the hot zone of the retort, shall be subjected to a very high temperature, so that the outer portion or envelope of the coal charge is carbonized rapidly and passed through what might be termed the "sticky stage"—resulting in the production of a carbonized skin around the coal, which facilitates the passage of the coal through the first portion of the retort. Continuous coagulation or cohesion of the whole mass passing through the retort is thus ensured, which facilitates its propulsion through the retort.

Fig. 1 [p. 102] is a sectional elevation of the retort-setting. Fig. 2 is an end view looking from left to right of fig. 1, but showing only the coke chambers and gas ascension pipes. Fig. 3 is a cross sectional view of part of fig. 1.

The retorts A are disposed in horizontal and vertical rows or tiers according to the capacity of the setting. They taper outwards from their inlet to their outlet ends both on their major and minor axes, and are of flattened cross section—preferably rectangular or approximately so. For example, the retort may have its minor axis only 4½ inches; "the minimum dimensions in any particular case being determined chiefly by the commercial requirements as to the size of coke produced." At the inlet to each retort is a chamber B, in which a piston or plunger C is actuated by hydraulic or other power. Each chamber or cylinder receives coal from a hopper D having a valve E at its inlet to prevent the outlet of gas.

When the piston is withdrawn to its extreme outer position, coal falls into the space in advance of it; and as the piston travels forward, coal is forced into the retort. It is found that, by ensuring that the new charge is brought against the previous charge before the latter is sufficiently carbonized to prevent cohesion of the old and new charges, the plunger is able to force the whole mass of material in the retort towards the discharge end and to effect simultaneous charging and discharging operations without the material wedging itself in the retorts. The exit end of each retort leads to a downwardly extending chamber F, having a gas-tight door (not shown) through which the coke is discharged at intervals.

The ports through which the gas passes to the ascension pipes G and hydraulic and foul mains H I are preferably situated in the coke chamber immediately adjacent the upper part of the exit end of each retort. With this disposition of the ports, the tarry content of the gas is "subjected to very considerable heat in passing through and from the retort, and is therefore very effectively cracked—resulting in a high gas yield."

The retorts have preferably three external temperature zones in their length. One zone is that in which the retort is heated by the flame generated in the combustion chambers J, extending from the inlet end of the retort; the intermediate zone, that in which the waste gases from the combustion chambers are circulated around the retorts through the chambers K; and the third, that in which heat is extracted from the exit ends of the retorts by the secondary air travelling through the passages M to the combustion chambers.

The retorts are heated at opposite sides by hot gases travelling in parallel streams in the same direction; so that uniform heating is ensured. The ports N, from which the gas issues into the combustion chambers, have hot secondary-air inlets O at opposite sides.

The arrangement of the retorts horizontal or slightly inclined provides for a very simple disposition of the gas, air, and exhaust gas passages. It is essential that the coal be subjected to the very high temperature developed in the combustion chambers J immediately it enters the hot zone of the retort "so as to obtain very rapid and practically complete carbonization of a skin or envelope around the coal charge."

The patentees conclude their specification thus: By the employment of our invention, we can construct plant having any desired gas yield

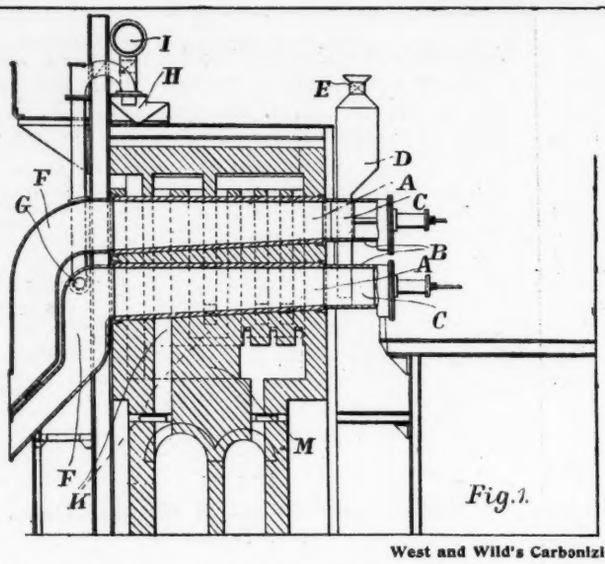


Fig.1.

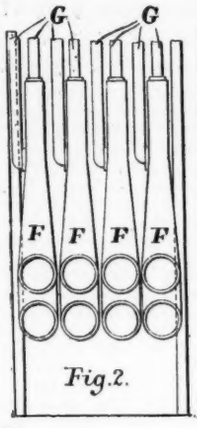


Fig.2.

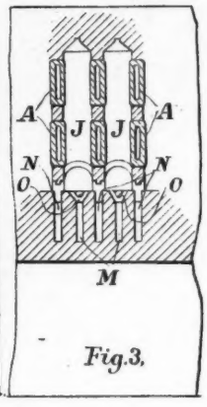


Fig.3.

West and Wild's Carbonizing System.

with less head-room and on a smaller floor space than with present types of continuous retorts, and the plant may be installed in existing buildings. The structural work is reduced and simplified; while the plant is more readily accessible for inspection and operation. Further, it may be readily opened out by removing the front ends of the retorts, and when required to re-start, can begin to charge coal direct into the empty retorts by the aid of the pistons or plungers. The latter may be propelled intermittently or continuously, and the speed and number of reciprocations in unit time regulated or varied to suit the conditions of working. Poking of the material in the retort is obviated—due to the positive movement imparted thereto. Further, owing to the pressure applied to the coal by the piston, small coal may be dealt with, while coke of a better quality is produced.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for April 10.]

Nos. 5572—5937.

Cartwright, W. B.—"Incandescent gas-burners." No. 5581.

Cooper, W. E.—See Cartwright. No. 5581.

Davies, W. E.—"Coke-ovens, and carbonization of coal." No. 5597.

Dyke, H. F.—"Device for improving the luminous power of gas." No. 5657.

Helps, G.—"Vaporizing or spraying liquid fuel." No. 5700.

Helps, G.—"Process for the manufacture of a producer gas for lighting, heating, and power." No. 5701.

Helps, G.—"Burners." No. 5702.

Hunter, J.—"Gas-burners." No. 5908.

Snell, C. Scott-.—"Burners for incandescent gas lighting." No. 5730.

Tomlinson, H. H.—"Incandescent gas-burners." No. 5581.

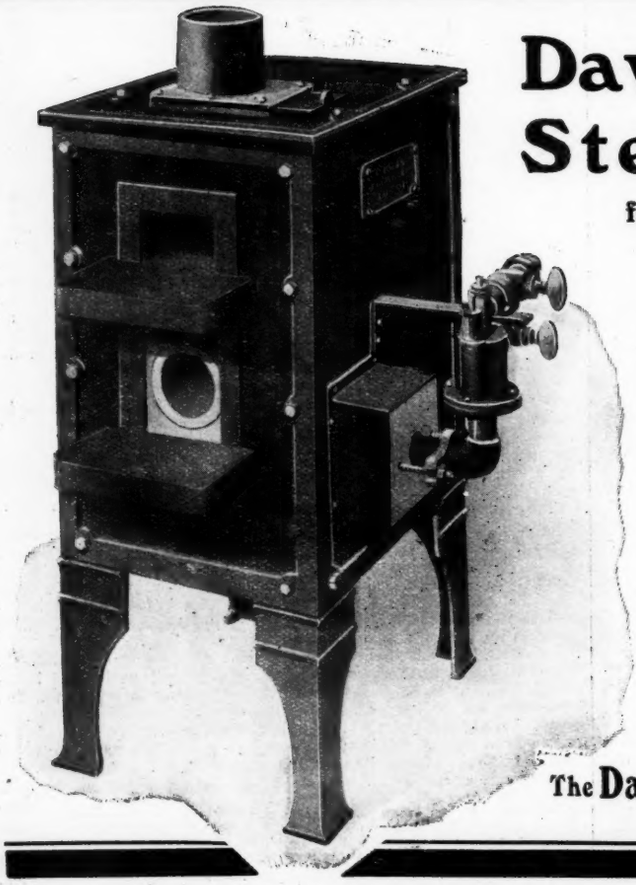
Torkington, A. W.—"Containers for gas under pressure." No. 5891.

Walker, J. W.—"Gas-generating and heating apparatus." No. 5736.

West, J.—"Charging retorts or chambers for the destructive distillation of carbonaceous materials." No. 5788.

Weyman, J. E.—"Gas governors or regulators." No. 5755.

Wild, W.—See West. No. 5788.



Davis High Speed Steel Furnaces

for Town's Gas and Air Blast

This small Furnace (D.H.S.T. 50) has been designed for use in establishments where small quantities of high-speed steel tools require to be dealt with. Although small, it is strongly constructed, and is in every way suitable for rough workshop use. It is of the twin-chamber type, fitted with pre-heating chamber, in which the steel is given a preliminary soaking heat, and the bottom chamber is muffled by means of a silica tube, capable of withstanding the highest temperatures. The work to be heated, therefore, does not come into contact with the flame. Stopper bricks are provided for both chambers,

Heating is effected by Davis Patent Air Blast Burners, for consuming gas at ordinary main pressure with an air blast of 3 lbs. pressure per sq. in.

The equipment of the Furnace is in every way complete, and includes regulators and control cocks for the burners, flue nozzle, and sliding damper.

Size of Chambers: Top, 10 in. × 4 in. × 2 in. high; Bottom, 9 in. × 3¼ in. diameter.

Prices £16 : 6 : 6.

H.S.S. Furnaces for larger operations, from £30.

The Davis Furnace Co., Diamond Foundry, Luton

(Proprietors: The Davis Gas Stove Co., Ltd).

HOUSE OF LORDS.

Progress of Bills.

The opposition has been withdrawn to the British Gas Light Company (Norwich) and the Wandsworth, Wimbledon, and Epsom District Gas Bills.

The Brixham Gas Bill has been read the third time, passed, and sent to the Commons.

HOUSE OF COMMONS.

The Financial Hardships Bills.

Last Thursday, the debate on the second reading of the "Financial Hardships" Gas Bills, which was adjourned on March 20, was further adjourned until Thursday, May 9.

Brixham Gas Bill.

The Brixham Gas Bill, having passed the House of Lords, was read the first time, and referred to the Examiners of Petitions for Private Bills.

Gas-Works and Oil Distillation.

Mr. Joynson-Hicks asked the Parliamentary Secretary to the Ministry of Munitions whether any plants had yet been established by the Government or gas companies for the distillation of oil from cannel coal and shale, and how much oil had up to now been produced.

Mr. Kellaway replied that the distillation of oil from cannel coal in gas-retorts was proceeding, and a number of gas-works were being fitted with the necessary subsidiary plant for extending the use of the process. It was not desirable in the public interest to state the quantity of oil produced, or likely to be produced, by this means.

Lighting, Heating, and Power Order, 1918.

Sir Daniel F. Goddard asked the President of the Board of Trade: (1) Whether, considering the difficulties of carrying out the new Order, the extra clerical labour which would be imposed on the undertakings concerned, and the number of persons who would inevitably become liable to prosecution and penalty, he would withdraw the order and substitute a simple ration of coal on all gas and electric lighting undertakings. (2) Whether he had realized that about two-thirds of the consumers of gas obtained their supply through automatic coin-meters; that these consumers of gas never had bills to show the quantity of gas consumed; that they never read their meters; that as they could not get gas without putting a coin in the meter they were naturally economical; that the large majority of them used more gas than the limited quantity mentioned in the order, and therefore became liable under the order; and that it would involve much labour with reduced staff of clerks to make the comparisons with the previous year, to assess the ration quantity for each consumer, and to advise the Board of Trade of the results; and whether, in view of these facts, he would exclude all consumers of gas through automatic meters from the operations of the new order. (3) Whether he knew that, under the new order, the effect of the rationing of gas was to encourage the use of more coal in order to save gas; and whether, for the advantages of munition purposes and economy, he would consider the advisability of the coal being converted into gas and used in this form rather than burn the coal as a raw material in open fires.

Sir A. Stanley said he was aware that the operation of the order would cause some difficulties, and would, no doubt, involve a great deal of additional labour on the part of the undertakings which supplied gas and electricity. They had already given him valuable assistance in this matter, and would, he knew, continue to do so. The supply of coal to these undertakings would, for reasons which he had already explained to the House, be considerably curtailed, and it had become necessary, therefore, to impose upon the individual consumers a corresponding obligation to limit their consumption; and unless this object was achieved, he could only anticipate that the public would be still more seriously inconvenienced in the coming winter by a failure of undertakings to maintain their supplies. He realized that the position of prepayment consumers presented special difficulties; but their large number made it impossible to except them from the operation of the order if the necessary economy was to be effected. Many would come under the minimum provision in the schedule to the order. He realized that the co-operation of everybody concerned was essential to success; and he hoped that with this, the objects of the order would be secured with the minimum amount of hardship to consumers.

Sir Stuart Coats asked the President of the Board of Trade, in view of the latest order for the reduction in the consumption of coal, gas, and electricity, what steps he proposed to take to relieve the position of those who, from patriotic motives, had already, for the past year, economized to the furthest possible extent.

Sir A. Stanley said he had endeavoured to meet the case by the provision in the order that a consumer may take as the basis his consumption of gas or electricity for the corresponding quarter of either 1916 or 1917, whichever suited him best. Beyond this, a provision was included under which, before proceedings could be taken for the infringement of the requirements of Part II. of the order, the consumer must be called upon for an explanation of the apparent excessive consumption, and such explanation must be considered. Where an explanation was found satisfactory, no proceedings would be taken. At the same time, he must emphasize the pressing necessity that existed for a general reduction in the consumption of gas and electricity.

Gas Cookers.

We know your Consumers' needs are fast growing, and we are working to keep up supplies.

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CHEPSTOW GAS BILL.

HOUSE OF LORDS COMMITTEE.—Wednesday, April 10.

(*Before Earl* Lancaster, *Chairman, Earl* Lindsay, *Lord* St. Levan, *Lord* Fairfax, *and Lord* Queenborough.)

This Bill, promoted by the Chepstow Gas Consumers' Company, proposes to extend the area of supply, to raise new capital, and to change the name of the Company to the Chepstow Gas Company.

Counsel for the Bill were Mr. G. M. Freeman, K.C., and Mr. Keen. The only petition against the Bill was by the Gloucestershire County Council and the Lydney Rural District Council, for whom Mr. St. John Raikes appeared.

Mr. Freeman, in opening, said the Company obtained their first Act of Parliament in 1857. The area then granted was the town and parish of Chepstow and a number of neighbouring parishes. Additions to this area were now proposed, including the whole of the parish of Tidenham, in the rural district of Lydney, in part of which a non-statutory supply was now being provided by the Company. In the early years of the Company, the dividend paid was only 1 p.ct.; but in recent years it had been 7 p.ct. The great developments anticipated in Chepstow were due, first, to the establishment of the Standard Shipbuilding and Engineering Company, and, secondly, to works by the Admiralty at Beechly Point, in Tidenham. This necessitated the building of a very large number of houses. The Standard Company would give employment to 1000 people. Altogether 2300 houses were proposed to be erected, all of which would require a supply of gas. There were also 300 houses at present in course of erection at Hardwick. The mains of the Company had already been laid through a large portion of this suburb, and extensions would have to take place. Considerable difficulty was being experienced in keeping pace with the demands; and, in consequence, a new and more convenient site had been selected, with siding accommodation on the Great Western Railway, for the erection of new gas-works. Originally, both the Rural District Councils of Chepstow and Lydney had passed resolutions in favour of the measure; but lately, at the instance of the Monmouthshire and Gloucestershire County Councils respectively, petitions against the Bill on matters of clause were deposited. At the last moment, however, the Monmouthshire County Council and the Chepstow Rural District Council did not appear; so that the only opponents were the Gloucestershire County Council and the Lydney Rural District Council, who appeared on a joint petition. So far as the County Council were concerned, they asked for further protection for their roads and bridges; but the Gas-Works Clauses Act, he contended, gave all the protection necessary. The Lydney Rural District Council asked for a purchase clause for so much of the Company's undertaking as was within their area. His answer to this was that, in the first place, a rural district council was not a lighting authority, and, in the second place, all that could be purchased were the mains without any works.

Mr. *James Robb*, the Manager and Secretary of the promoting Company, said that the output of gas so far for the current year showed an increase of 30 p.ct. over 1917, which, in turn, was 25 p.ct. more than in 1916. The annual make now was 12,000,000 c.ft. The new works were on the basis of 120,000,000 c.ft.—a figure which it was expected would be reached in ten years. The site for the new works was 14 miles from Chepstow. The new capital asked was £70,000.

Cross-examined by Mr. Raikes, witness agreed to giving seven days' notice of the Company's intention to open the roads, except in case of emergency, and also to submit plans of proposed works, which, as a matter of fact, was already done. He was willing to continue the present practice of placing pipes either in the roadway or footway, in accordance with the instructions of the Surveyor.

Mr. Raikes said that this substantially met the case of the County Council.

Witness, questioned as to purchase, supported the views put forward by Mr. Freeman.

Mr. *W. Doig Gibb*, who has been consulted by the Company, said that the site for the new works was 8·6 acres, of which 6·4 acres were available for actual buildings. He objected to the proposed power of purchase asked for by the Lydney Rural District Council, both on the grounds already mentioned and also in the interests of the consumer, as a supply could be given much more cheaply from a large works than from a number of small ones. The whole tendency at the present time was towards centralization of supply.

Mr. Raikes said the proposal was that the purchase clause should not be operative until Parliament had given the Rural District Council permission to become the lighting authority.

This closed the case for the Bill.

Mr. Raikes, addressing the Committee on behalf of the Lydney Rural District Council, said that all the development that had been spoken of was taking place in the parish of Tidenham, just outside Chepstow, and in the rural district of Lydney. As a result, this district was rapidly taking on an urban character, and the time would come when the Rural District Council would have to ask for urban powers. This would constitute it the lighting authority. If the Bill went through as it stood, the Council could not force the Company out of the district. The Council did not ask for absolute powers to purchase, but only in the event of Parliament granting them urban powers and authorizing the purchase.

Mr. Freeman said the proposed clause prevented the Company from opposing any such application for purchase powers.

Mr. *W. Jones*, the Chairman of the Lydney Rural District Council, gave evidence, and said there was at present no scheme by the Rural District Council for seeking urban powers.

The Committee decided not to grant the proposed purchase clauses. The other clauses were subsequently adjusted; and the Bill was ordered to be reported for third reading.

Gas in War Time Industries

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MISCELLANEOUS NEWS.

BIRMINGHAM GAS DEPARTMENT.

Presentations to Captain Hilton.

On Tuesday last, Captain R. S. Hilton, for nearly eight years General Manager and Secretary of the Birmingham Corporation Gas Department (who recently accepted an important position with the Birmingham Railway Carriage and Wagon Company), concluded his official connection with the department. The esteem and respect—indeed, the affection—with which Captain Hilton was regarded by the staff and employees in all departments was shown in presents which were made to him at the Birmingham and Midland Institute during the evening. The large picture theatre was crowded. Sir HALLEWELL ROGERS, the Chairman of the Gas Committee, presided; and he was supported by members of the Committee and representatives of all departments of the undertaking. A high-class concert was provided by members of the staff—the ladies played an important part in making this event thoroughly successful—and during an interval the gifts, of a very handsome character (including a diamond and pearl brooch for Mrs. Hilton), were presented. The gifts to Captain Hilton included a loving cup, bowl, candelebra, and other articles in silver, from the staff and workpeople of the department, and a silver cigar-box, studs, and a pearl pin from the Gas Committee. The silver plate was artistic and substantial.

The CHAIRMAN read a letter from the Lord Mayor (Alderman A. D. Brooks), in which he expressed his great regret in being prevented, owing to a cold, from attending the farewell gathering, and expressing regret for Captain Hilton's resignation. Having made a fitting reference to the members of the Gas Department who are on active service, Sir Hallewell recalled the fact that at the outbreak of war Captain Hilton took a command in the Royal Warwickshire Regiment, and went into training with his battalion at Sutton Coldfield. When Lord Moulton came to consult the department about getting T.N.T. from the various gas-works throughout the country, he at once saw that in Captain Hilton he had the right man for dealing with the construction and the installation of the plant. He had since been doing valuable work at home. He had done his best for the nation; and while with the Corporation he had done his best for the Gas Department. This gathering was unique in the annals of the Birmingham Corporation—indeed, he believed it was unique in the annals of any corporation to have a presentation to one of the chief officials subscribed by nearly 2000 of the employees—from the office boy and the labouring man upwards. This fact spoke volumes for what Captain Hilton had done. When in London in connection with the National Gas Council, the head of the largest gas-works in the country condoled with them upon losing Captain Hilton. His departure, he said, was not only a loss to the Birmingham Corporation and the gas undertaking, but was a great loss to the gas industry generally. This served to show how Captain Hilton had made his mark. He had played an important part in the development of the Birmingham gas undertaking. His resignation amounted to a personal loss. They were not parting with him as Manager, but as a man—it was the man who had permeated the whole atmosphere of the department, and not the manager. He had created an atmosphere of the highest ideals of civic official life. He had had to drive various and difficult teams—the Gas Committee, to whom he had given loyal and unflinching service, the engineering team, the office staff, the chemists, the workmen—and by each team he was respected greatly, because all recognized that in the Captain they had a really straight man [applause]. He had been zealous in his work, impartial, and very tactful; and he had created an *esprit de corps* through the whole department. If asked to describe him briefly, he would say that he was a straightforward gentleman. That the right spirit prevailed in the department was evidenced by the fact that he, as Chairman of the Committee, should have been asked to make the presentation. As to the future, it was proposed to divide the office of General Manager and Secretary. Mr. A. W. Smith had been appointed Secretary; and he was satisfied that no better choice could have been made. In regard to the appointment of General Manager, however, nothing definite had yet been done. The Committee would try to make the best choice; and he believed they would then have the support of the whole department. Captain Hilton's going was to him (Sir Hallewell) a real personal loss. He had been in business life a great number of years, and had come in contact with many men; but there was no man he should regret parting with more than Captain Hilton. He hoped their friendship would continue.

Alderman JOHN HENRY LLOYD, a member of the Gas Committee, also spoke in support, referring to Captain Hilton's fine business capacity and conciliatory attitude. In a few years he had made a great place in the municipal life of Birmingham.

Mr. E. HALLAS (one of the Secretaries of the Birmingham Municipal, Gas, and Labourers' Society) testified to Captain Hilton's straightforward dealings in negotiations on behalf of workmen.

Mr. J. FOSTER (Engineer at the Windsor Street works), Mr. W. H. POWELL (Cashier), Mr. PREECE (Workmen's Representative at Nechells), Mr. WHITEHOUSE (Gas Fitters' Representative), and Mr. WHITE (Meter Inspectors' Representative) also spoke in support of the testimonial.

Captain HILTON, who was cordially cheered in rising to reply, said of late years particularly he had felt he had their confidence. He was delighted that the staff and workmen had joined together to make one presentation. He was touched by this fact, because he felt it was symbolical of the unity of the department, for which he had striven since coming to Birmingham. He hoped staff and workpeople would often join together on some common ground. His relations with Sir Hallewell Rogers had been always most cordial. The cordiality had increased as time went on—it was a relationship not of Chairman and official, but of elder and younger brother. He preferred to look

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upon Sir Hallewell as the elder brother—as the one who chose to allow the younger to have his fling, but to stand by with words of warning or advice. The Gas Department had always "played the game." Before the war it followed that policy on the athletic field; and it was doing the same to-day on the fields of Flanders. Something like 1200 men—about half of the total number employed—joined the forces. It was a magnificent record. Those left behind had rendered loyal and ungrudging service. The four years had been years of anxiety and pressure. Every department was affected alike; but all had responded admirably. They owed a debt, too, to the women who took the places of the men in the offices—they had done excellently. His aim had been for the unity of the department. He had broken many cast-iron rules, and broken down a number of water-tight compartments. He was glad to think that this had been for the better. A water-tight compartment might save a ship; but it might wreck a business. The water-tight compartment had gone between the works and the Council House; it had gone in various sections of the works; and there were already many holes through the water-tight compartments that divided officials from workmen. He would like to see the last water-tight compartment swept away.

The proceedings concluded by the huge audience singing with great heartiness "For He's a Jolly Good Fellow," and giving three hearty cheers.

THE COAL TAR SITUATION IN THE UNITED STATES.

In order to point out the opportunity existing for developing some industries that had hitherto been comparatively neglected in the United States, the Bureau of Mines some time ago issued a report [Technical Paper No. 89] on coal-tar products and the possibility of increasing their manufacture.

In an introduction by Mr. Horace C. Porter, it is remarked that popular interest in coal tar is centred mainly in dye-stuffs and the other refined drugs and chemicals derived from it. The United States, for commercial reasons, has developed little manufacture of these products, and has been dependent upon European nations for the bulk of its supply. In considering why this condition exists, there must be borne in mind the fact that only a small part of coal tar (about 10 p.ct.) can be made into drugs and dyes. The other 90 p.ct., suited only for the manufacture of pitches and various heavy oils, forms the basis of an industry already well developed in the United States. Increased development of an industry based on only 10 p.ct. of the tar, or on 0·5 p.ct. of the original coal, must depend, in important measure, upon advantageous commercial disposal of the other 90 p.ct. of the tar, or the other 99·5 p.ct. of the coal.

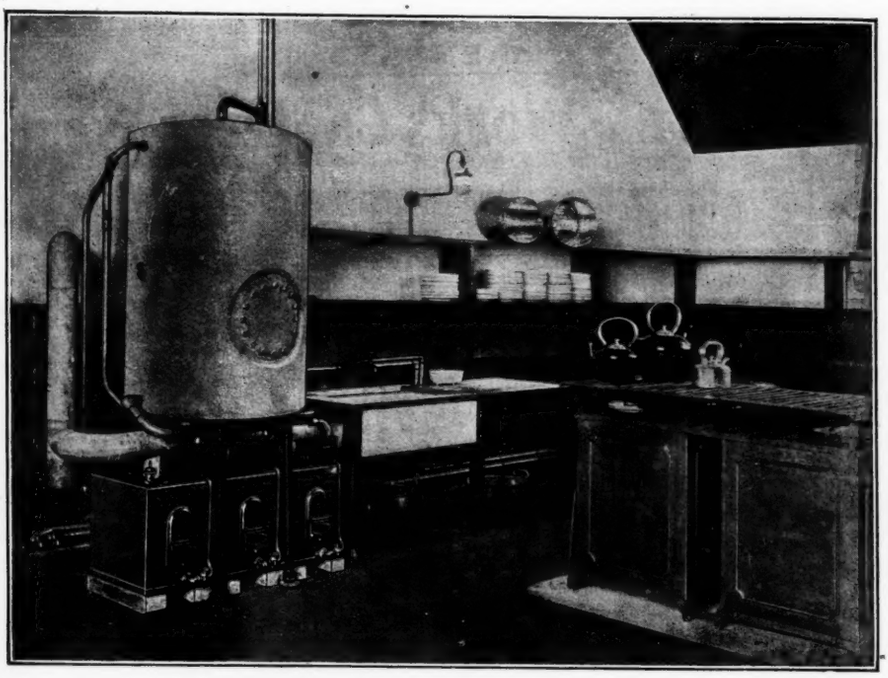
Coal tar, however, is not the only source of what are commonly known as "coal-tar" dyes and drugs. So-called "gas benzol," or light oil, which is abstracted from coal gas, and is therefore, like tar, a bye-product of the carbonization of coal, constitutes an important commercial source of these refined products. High-grade gas coal yields nearly 1 p.ct. of "gas benzol" by weight, the value of which in the crude state is fully 20 p.ct. of that of the coal. The light oil of tar, on the other hand, constitutes only 0·1 to 0·2 p.ct. of the coal. "Gas benzol," unlike tar, has no constituents that cannot be utilized in the making of dyes and refined chemical preparations. About 25 p.ct. of the combined yield of tar and "benzol" may be made into the dyes, drugs, and refined chemicals for which America has heretofore practically depended on Germany. The gross market value of these refined products made from the 25 p.ct. portion is probably at least twice that of the pitch and heavy oils recoverable from the 75 p.ct. portion. On the basis, therefore, of the comparative values of products, the manufacture of refined "coal-tar chemicals" appears to be an exceedingly important offshoot of the coke and gas industry.

In 1913, the United States produced about 150 million gallons of coal tar and 7½ million gallons of "gas benzol." The output of bituminous coal—the source of coal tar—was somewhat more than 475 million tons. Germany, with a coal output of only 295 million tons in the same year, produced more than 250 million gallons of coal tar, and about 50 million gallons of benzol, 3½ million gallons of tar being imported. Germany exported in the fiscal year ended June 30, 1913, coal-tar dye-stuffs worth over $55,000,000; whereas the United States during the same year imported dye-stuffs worth some $10,000,000—practically the entire consumption.

HEATING TENEMENTS WITH GAS EXCLUSIVELY.

American Experience.

The results of actual experience during the past winter especially, and within the last three years, in heating six-roomed houses built in rows, and blocks of flats or apartments ranging near similar accommodation, where the only addition to gas for all purposes was a combination gas and coal range in the kitchen, or steam heating apparatus supplied from a central source, as related in recent issues of the "American Gas Engineering Journal" by various authorities, who can quote from actual experience, either as representing the suppliers of gas or the manufacturers of the apparatus used, possess special interest at the present juncture—and that from a much wider and varied point of view than the mere increased use and advertisement of gas. We emphasize last winter, because in many instances coal was practically unavailable, and could not be used in the kitchen range or under the central steam-boiler. If gas had not been at hand to fill the gap, serious suffering, injury to health, and even loss of life would have occurred to a terrible extent during the cold weather experienced during December and January, which was more severe than had been experienced in New York for many years. The extent to which gas



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met the situation is illustrated by the phenomenal increase in output reported in many parts of the United States.

These experiences should be carefully considered, not only by all who are interested in extending the use of gas, but also by those responsible for drawing up schemes for restricting the use of fuels, for preventing extravagant usage of coal and waste of the residual products (especially substances for which the demand tends to outstrip the supply), the general conservation of our coal supply, the abatement of smoke, the reduction of cartage and rail transit, and of labour generally to the lowest possible limit. In the absence of any equitable and satisfactory scheme for reducing the consumption of gas, they indicate one direction in which to look for improvements that would benefit all the parties concerned and injure none. The importance of this point is evident when we compare the consumption of gas indicated in the extracts subsequently quoted, with its equivalent in coal used for manufacture—one ton for every 10,000 to 20,000 c.ft., according to the methods adopted. The total consumption for all purposes is represented by a lower quantity of raw coal than would be required for warming and cooking only if used direct. But the gas means 50 p.ct. of coke available for sale, and replacing an equivalent weight of raw coal, the practical utilization of all the valuable substances contained in the tar and ammoniacal liquor, and the recovery of benzol and toluol by oil washing. Therefore, it is not too much to claim that in this direction there is scope for both individual and national advantage. Any saving of labour, of rail or horse traffic, appears to be a consideration more important than any of the numerous claims that have been urged on gas undertakings during the last three years. And here we have the elimination of the horse, cart, and men required for loading at the yard, for conveyance, delivery into the consumer's coal cupboard, for the subsequent collection of the ashes, and conveyance to the municipal destructor; of the storage in advance, the uncertainties of supply, the labour of kindling fires, conveying coal, removing ashes to the dust bin, &c. The consumption can be cut down and accurately controlled to suit requirement, without waste of the stand-by order that is inseparable from solid fuels; and there is no pollution of the air with soot, sulphur, and other impurities that damage property and are injurious to health.

The actual charges for gas consumed in tenements fitted with gas-steam radiators or other gas appliances, or in buildings of any size, indicate economy as compared with the equivalent cost of coal and the caretaker of a boiler and circulating system, to say nothing of the smoke, soot, ashes, and dust avoided. The methods by which business in this direction has been secured are intelligent advertising and personal solicitation, getting in touch with owners, architects, and builders concerned in all new structures immediately projects have been accepted. Full details are given of methods in actual use. At Savannah (Ga.), auxiliary and stand-by heating is regarded with indifference, and only exclusive prospects canvassed. The temperature seldom falls below 20° Fahr., and no question as to excessive consumption arises. Over 300 gas-steam radiators are already fixed and in operation with satisfactory results that will lead to the placing of a much larger number. The Public Service Gas Company of New Jersey, working on similar lines, are building an important branch of business. In view of the fact that spring is the season for commencing new buildings, preliminary advertising, circularizing, &c., are commenced in the autumn, as a preparation for an active spring drive. Similar experience is reported from Tampa (Fla.) and from the Consolidated Gas Company of New York, where the importance of educating salesmen to place, not the cheapest, but the most efficient and durable, apparatus is insisted on. Tables showing the sizes of supply pipes that will take care of the maximum requirements have been prepared. In estimating the size and number of radiators required, the rule is to allow one square foot of heating surface for each 200 c.ft. space to be heated, a similar area for each 2 sq. ft. of glass, and the same for each 20 ft. super. of exposed wall or roof. The total gives the area of heating surface required to maintain 70° inside, with an outside temperature of 0°. If hot-water radiators are used, the heating surface should be 50 p.ct. larger.

Some years previous to the advent of coal difficulties, a builder in Astoria recognized the advantages of applying gas to the heating of smaller size tenements, and evolved a scheme suitable for six-roomed houses with bath-room, comprising a combination range in the kitchen and a heater on the argand burner principle in the parlour, for which an exceptionally high efficiency was claimed, due to the unusual length of heat travel and the perfect combustion that dispensed with the necessity for a flue, and enabled the whole of the heat generated to be thrown into the space where it was required. Finding that these claims were fully realized, and that the system was greatly favoured by prospective buyers or tenants, he adapted this method of heating to all new buildings. The heater was so placed that it faced the door looking on to the stairway and landing; so that, when the doors were open warmth might pass to the bedrooms. The occupants certified that, even under extreme winter conditions, as much had been realized. While they obtained satisfactory warmth, the average consumption of gas per month was only slightly over 5000 c.ft. In some larger houses assisted by central steam heating, the consumption was about 10,000 c.ft. per month. Experience enabled him to improve, in the designing of buildings, on the principle of utilizing the parlour heater for warming up the bedrooms. He placed the hall, stairway, and landings in the centre, with all doorways opening directly on to them. As will be judged from the cost of the buildings (£700 each) and the extent of gas consumption, while willing to incur necessary expense for health and comfort, the tenants would exercise care in the direction of economy. Their practice was to open all doors for a short time before retiring at night—thus allowing a free circulation of warmth throughout the house.

Another builder had followed similar lines, but with the addition of a "Perfecto" heater on the first-floor landing, three years ago, in a building comprising 32 sets of flats; and a second block of 51 flats a year later. Many of the tenants had never depended on gas exclusively, and at first were inclined to be very economical. The gas bills

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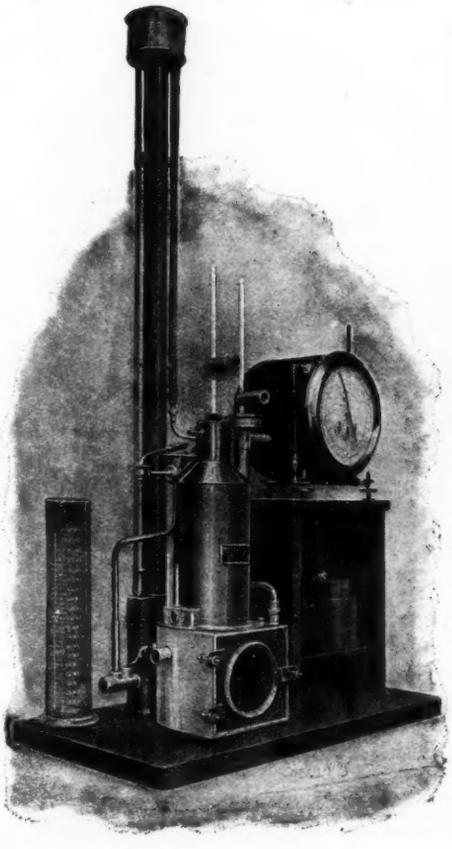

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did not average more than 10s. 6d. per month. But they soon acquired confidence, and consumed more freely; and during the cold winter months the gas accounts ranged from 16s. 8d. to 25s. per month. The services had proved most satisfactory to all concerned; and the flats sold readily and were continually occupied. There was no trouble in holding tenants even in the summer. They were preferred to central steam heating. The tenant had full control of the consumption, and could burn much or little as he wished; and the vexed problem of securing a competent janitor to take charge of a central heating system was eliminated.

A third builder-owner instanced flats comprising five rooms and a bath, furnished with central steam heating, which was unavailable on account of the shortage of coal, forcing the tenants back on the exclusive consumption of gas for warming. In these circumstances, the average consumption of gas per month was 6000 to 8000 c.ft. Illustrations are given of a block of 88 three, four, and five room flats, of a row of fair-sized houses and a building comprising seven 5-room and seventeen 4-room flats, in Brooklyn, also of a group of artizans' tenements at Bridgeport, all exclusively heated by gas-steam radiators.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Ammonia.

London, *April* 15.

There is very little new to report in the position of tar products in the London market. Pitch is in a very satisfactory position; and inquiries are already in the market for export for next season at very good prices. It appears that the minimum price of makers is 55s. net per ton f.o.b. at their works. Tar materials for road purposes are also being taken very well, and further supplies are being solicited. Solvent naphtha is again strong at 4s. 3d. to 4s. 6d. net per gallon in bulk *ex* makers' works. Creosote, carbolic acid, benzol, and toluol are all still under official control at fixed prices. Anthracene remains steady at 6d. per unit, packages free, for 40-50 p.ct. quality.

Sulphate of ammonia is unaltered. For this season London makers appear to be practically sold out.

Tar Products in the Provinces.

April 15.

The average values for gas-works products during the week were: Gas-works coal tar, 28s. to 32s. Pitch, East Coast 20s. to 25s. per ton; West Coast—Manchester 18s. 6d. to 19s. 6d., Liverpool 19s. 6d. to 20s. 6d., Clyde 19s. 6d. to 20s. 6d., nominal. Benzol 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 3s. 10d. to 4s. Heavy naphtha, North, 2s. 3d. to 2s. 6d. Creosote, in bulk, North 4d. to 4¼d. Heavy oils, in bulk, North 4½d. to 5d. Carbolic acid, 60 p.ct. East and West Coasts, 3s. 4d. naked. Naphthalene salts, 90s., bags included. Anthracene, "A" quality, 4d. to 6d. per unit; "B" quality, 1½d. to 2d.

Manchester District Tar Prices.

The average price realized for tar in this district, based on the value of the products for the month of February, was 34s. 8d. per ton.

FROM A MARKET CORRESPONDENT.

Tar Products.

Private business has not been on a very large scale; but the demand for all those products which are required in the preparation of munitions shows no signs of falling off. Thus benzol, toluol, creosote, and carbolic acid are going into consumption on official account practically as fast as they are produced. Naphthalene shows no indication of improving as far as refined is concerned; the difficulty of obtaining shipping facilities for the export trade proving a considerable obstacle to business. Quotations, however, do not fall to any material extent; £30 per ton being still obtainable. For crudes, the usual wide range of quotations prevails—viz., from £7 per ton for lower grades up to £15 for better qualities. The strength of these is somewhat remarkable, as the demand from the firelighter industry has now practically ceased for the season. Naphthas are well maintained, and are settling down into a steady business at late rates of 4s. 3d. to 4s. 6d. per gallon for solvent and 3s. 3d. for heavy. There is no shortage in supplies, and the demand is not nearly so heavy as some few weeks ago, before the system of licences was introduced. As long as conditions remain as at present, and no attempt is made to force up the price to a higher level or to introduce an element of speculation into dealings, it is thought that all will be well with the market in this product. Cresylic acid is very firm, and is in good demand for disinfectant purposes. The quotation is now in the neighbourhood of 3s. 3d. to 3s. 6d. per gallon, casks included. Anthracene is only steady at from 3d. to 4½d. per unit per cwt. Aniline oil is dull at 1s. 3d. per lb. Pitch remains about the same, with a slight tendency to further improvement in the Provinces, especially Manchester, where conditions have been far from satisfactory for some time. The fact that the season of heavy production is over for a time, and that current business is of sufficiently large proportions to prevent stocks accumulating, probably accounts for the better feeling. The export side of the trade is not encouraging; being affected by the difficulty of obtaining shipping facilities. This is particularly felt on the east coast, where prices remain at about 30s. per ton. London, of course, is better situated, and is able to handle trade more advantageously than elsewhere; and prices remain comparatively firm at 50s. to 52s. per ton. The range of quotations is as follows:

Aniline Oil (pure): 1s. 4d. per lb.

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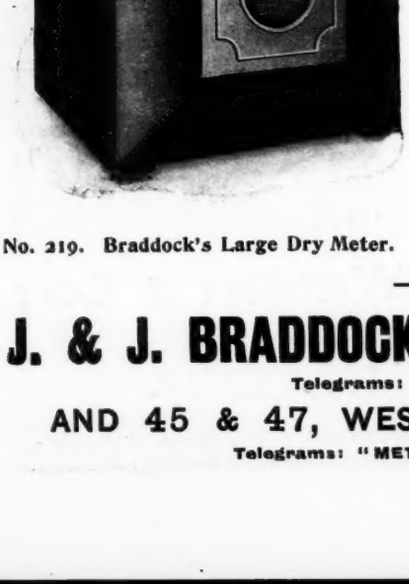

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Telegrams: "METRIQUE, LAMB LONDON." Telephone No. 2412 HOP.

Benzol: 90% London, 1s. 0½d., North 10½d. to 11½d.; 50% North 1s. 4d. to 1s. 5d. naked per gallon.

Carbolic Acid: 60% East and West Coast 3s. 6d. per gallon; crystals 40% 1s. 3d. per lb.

Crude Tar: London 32s. 6d. to 35s. Midlands 27s. to 29s.; North 28s. to 30s. per ton, *ex* works.

Pitch: London 48s. to 50s. f.o.b.; East Coast, 26s. to 28s. f.o.b.; West Coast—Liverpool 22s.; Manchester 24s. f.a.s.; Clyde 27s.

Solvent Naphtha: Naked London 90-190% 3s. to 3s. 3d.; North 2s. 9d. to 3s. per gallon; 90-160% naked London 4s. 3d. to 4s. 6d.; North 4s. to 4s. 3d. per gallon.

Crude Naphtha: Naked 30% 8¼d. to 8½d.; North 6¼d. to 6½d.

Naphthalene: Refined £30 to £32 10s.; salts 80s., bags included.

Toluol: Naked, London 2s. 4d.; North 2s. 3d.

Creosote: Nominal, London 4¼d.; North 4d. to 4¼d. (Government price, 75s. per ton f.o.b.—equal to 4¼d. per gallon); heavy oil, 4¼d. per gallon in bulk.

Anthracene: "A" quality, 40-45%, 4½d. per unit; "B" quality, 1¾d. to 2¼d.

Cresylic Acid: 95%, 3s. per gallon; 97-99%, 3s. 3d. to 3s. 6d. per gallon, casks included, *ex* works London and f.o.b. other ports.

Grease Oils 18° Tw. (naked) £6 per ton f.o.r. makers' works.

Sulphate of Ammonia.

Conditions do not alter, and official demands continue to grow apace. It is becoming more and more certain that even next year there will be a shortage of supplies, in spite of the all-round efforts now being made to increase outputs by the erection of new plants. It has to be remembered that the synthetic processes, now being experimented with, may account for some increase in production. At the same time, both agricultural and munitions demands are continually increasing, and will take a lot of meeting.

In America, similar conditions prevail, with the exception that sulphate of ammonia is no longer included among fertilizer materials.

Irish Gas Lighting Conditions.

On the Public Lighting estimate for £33,204 for the ensuing year being submitted to the Dublin Corporation, several members complained of the complete suspension of lighting in the suburban districts. Mr. Allen (the Secretary of the Lighting Committee) explained that the estimate was very substantially reduced last year, and that to meet this it was found necessary to shut-down the lighting in the summer season—a course that was also being adopted this year. On the motion of Alderman Luaid, the charge for gas for the public lamps was reduced from £4930 to £4284. Street lighting has been dispensed with in Londonderry; and a similar step has been taken in Tipperary. The Drogheda Corporation have referred to the Law and Finance Committee recommendations of the Cross-Channel Transport Controller (Mr. H. G. Burgess) for reductions in coal and gas consumption for both public and private purposes. At Omagh, it was proposed to increase the rate by 1s. 10d. (to 10s.) owing to the heavy gas-works charge, due to cost of coal; but it was ultimately agreed to fix the amount at 9s. 8d. The Ballyclare rate has been increased, owing to the additional cost of lighting. The Waterford Gas Company have increased the price of gas for engines from 4s. 2d. to 4s. 7d. per 1000 c.ft. The Dundalk Gas Company have decided that consumers can only be allowed 75 p.ct. of the quantity of gas consumed in the corresponding quarters of 1916-17; and that, in any case in which the limit is exceeded before the end of a quarter, the supply will be discontinued until the commencement of the next quarter.

Quality of Gas at Cheltenham.—At the Cheltenham Town Council a letter was read from the Board of Trade, stating that they had communicated with the Ministry of Munitions with reference to the calorific power of the gas supplied by the Cheltenham Gas Company; and it appeared from the result of the test taken by the Corporation that *primâ facie* the Company are making gas which would comply with their statutory requirements as regards calorific value, but that, owing to the recovery of bye-products for the Ministry of Munitions, the calorific value of the gas as supplied to the public is reduced below the standard. A letter was also read from the Ministry of Munitions, stating that while the Gas Company were scrubbing the gas in accordance with the requirements of the Minister of Munitions, they were relieved of any penal consequences in case as a result thereof they failed to keep the gas up to the standard imposed upon them by the law, and asking that the result of any test taken should not be published.

Gas Rationing at Brighton.—On the subject of gas rationing at Brighton, the "Sussex Daily News" says: People have come to accept rationing as part of the inevitable in carrying-on through the war; but there is much heartburning among many inhabitants of Brighton and Hove in reference to the proposed gas and electricity allowances. In response to the appeal for coal economy last year, a lot of money was expended upon cookers and gas-fires. The Gas Company, working with a depleted staff, made strenuous efforts to cope with the demand for these convenient appliances. Now the advantages are to be curtailed by the restrictions on gas and electricity consumption; and the consequent irritation is not appeased by the general impression that the regulation will really save little gas. Nor is this the only complaint. It is pointed out in well-informed quarters that, while the compulsory saving of one-sixth in the total consumption will produce adequate economies in cases of large totals only, the average small householder, who has already reduced as much as possible, will be driven to eke out his limited allowance by a larger use of coal for heating purposes, and will be thus inconvenienced without any appreciable economy. Taking the whole area served by the Brighton and Hove General Gas Company, the reduction in output is not expected to exceed 17 p.ct.; and it is considered doubtful whether such a result would compensate for all the disadvantages inseparable from the scheme—not the least being the hindrance to cooking which is so essential in view of the food problem.

WE HAVE RESPONDED to the

IMPERATIVE TRANSITION

FROM

PEACEFUL PURSUITS

TO

NATIONAL WAR SERVICES.

Nevertheless we are doing our utmost to meet as far as possible the

DEMANDS

OF OUR

Peace Time Friends.

PATRIOTISM DEMANDS THE FIRST.

LOYALTY TO FRIENDS ENJOINS THE LATTER.

Manufacturers:—

CANNON IRON FOUNDRIES, LTD.,

DEEPFIELDS, nr. Bilston, Staffs., Eng.

London Office and Show-Rooms:—

57 to 60, Bath House, Holborn Viaduct, E.C.

Australasian Agents:—

MOLDEN & BUDDEN PTY., LTD., 364a, Little Collins St. Melbourne, Vic., and at Sydney, N.S.W.

Brentford Gas Company's Price.—The Brentford Gas Company notify that the price of gas has been increased 8d. per 1000 c.ft. from Ladyday.

Belfast Gas Poisoning Case.—A verdict of death from gas-poison, self-administered during temporary insanity, was returned by a Coroner's Jury at Belfast, in the case of Thos. Johnston, who was found seated in a chair in his house, with a gas-pipe in his mouth.

East Cowes Gas Company.—Presenting the accounts for the year ended Dec. 31, the Directors reported that, compared with the previous year, the sale of gas increased by 4,515,800 c.ft., or 12·8 p.ct., and the revenue derived from the sale of residual products by £298. The already abnormally high charge for coal was increased in September last by a further 2s. 6d. per ton, to meet an advance in wages granted to the miners. The Directors also increased the wages of the Company's employees during the year to an important extent. After charging to profit and loss account £390 for interest and income-tax, a sum of £1927 remained to the credit of the account. The Directors recommended the declaration of a dividend for the past year at the rate of 6½ p.ct. per annum (less income-tax), which would absorb the sum of £780, leaving a balance of £1147 to the credit of the profit and loss account to be carried forward.

Air-Raid Warnings at Burnley.—Complaints having been made of the delay which had occurred in the extinguishing of street-lamps on the occasion of the last air-raid warning, it was mentioned to the Burnley Watch Committee by the Chief Constable that the Gas Engineer (Mr. J. P. Leather) was not now on the official air-raid warning list, and that therefore the Gas Department were not immediately notified of the possibility of an air raid. The Committee decided to call the attention of the Gas Committee to the Chief Constable's report. Before the Gas Committee met again, there was a sitting of the Town Council, at which there was some criticism of the apparent lack of responsibility. Alderman Emmott (the Chairman of the Gas Committee) gave an explanation from Mr. Leather, in the course of which he said: "I still am called up on every occasion on which there is any air-raid warning. All that I escape is the rousing out of sleep of myself and family every few nights for test calls. The only purpose of test calls is to see that the telephone attendant is on duty." Councillor Nuttall said the reply did not square with the facts, and with the letter sent by Mr. Leather to the Chief Constable asking for his name to be removed from the list of those who received air-raid warning. The letter did not say that he only wished to be relieved from test calls. The discussion ended by a promise from the Chairman of the Committee that the matter would be put on the *agenda* for the next meeting.

STOCK MARKET REPORT.

THE week just concluded on the Stock Exchange had a somewhat chequered career. On the opening day the tone was decidedly favourable, influenced by the satisfactory nature of the war news from the Western front; and markets in general ruled firm. By midweek, however, almost a dead calm had come over them, and everything drooped from sheer inaction and lack of support. This feature was ascribed not only to the less gratifying character of despatches from the seat of war, but to the provisions of the Man Power Bill, as suggesting the prudence of realization to those who may be caught in the meshes of this net. But on Friday, when the war news was at its darkest, a reaction set in, and buyers made their welcome appearance in most of the leading markets.

In the gilt-edged department, all Home Government issues made a good start, but were down lower on Wednesday. Consols began to recover on Thursday, and next day War Loans shared in their movement. Home Rails were firm for a day or two, especially prior charges, and then went comfortably to sleep. There was nothing particular to note in Americans and Canadians; but Argentines moved irregularly—first scoring a rise and then as rapidly losing it.

In the Foreign Market, a noteworthy feature was the firmness of French at the close. Spanish were nicely helped up by the state of the Exchange. Brazilian and Japanese were also steady. The Miscellaneous Market, taken on a whole, was dull. Rubber and Oil did not do well, and buyers generally all round were hard to find.

Business in the Gas Market was no better than in the week before, and if possible was upon an even more reduced scale, and without any interesting feature. The prices marked for bargains actually effected showed, almost without exception, no falling-off from the record of the previous week; but the tendency was not firm consistently throughout the list. In the Continental undertakings, Imperial Continental quotation was put a point lower, and Continental Union two points lower.

In the Money Market rates were extremely easy.

Bargains done for cash during the week were as follows: On Monday, Bombay 5, Commercial 4 p.ct. 67, European 7¼, Gas Light ordinary 64¼, 64⅛, 64¼, 64⅞, ditto preference 69, 69⅛, Imperial Continental 85, 85⅛, Metropolitan of Melbourne bonds 88, Primitiva preference 54s., 55s., ditto debenture 77, South Metropolitan 63¼, 63½, 63⅝, 64. On Tuesday, Continental Union 36, Gas Light ordinary 64¼, 65, ditto preference 68½, Imperial Continental 85, Primitiva 35s. 3d., 35s. 9d., ditto preference 55s., 56s., ditto debenture 77½, South Metropolitan 63½, 64, Bridgend 10 p.ct. 5 1/16. On Wednesday, Alliance and Dublin 50⅞, 51⅛, Gas Light ordinary 64, 64⅛, 64⅜, 64⅝, Imperial Continental 85, Primitiva 35s. 6d., 36s., South Metropolitan 64¼. On Thursday, Gas Light ordinary 64¼, 64⅛, 64⅜, 64⅞, ditto preference 69¼, Imperial Continental 84½, Primitiva preference 53s., South Metropolitan 63½, San Paulo preference 7¼. On Friday, Gas Light ordinary 64¼, ditto preference 68, 68½, Primitiva preference 56s., South Metropolitan 64¼.

The Bank rate is 5 p.ct., as fixed on April 5.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Share.	When last Dividend.	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
175,472	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	55—60	..
1,551,868	,,	April 8	2½	4⅜	Alliance & Dublin Ord.	59—64	50—55*	50⅜—51⅛
874,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76—79	58—63	..
980,000	5	April 22	7½	3/6	Bombay, Ltd.	5⅞—6⅛	5—5½	5
60,000	10	Feb. 26	16	13⅓	Bourne- { 10 p.c.	20—30	22—24	..
883,110	10	,,	7	7%	mouth Gas { B 7 p.c.	15—15½	10½—10⅝	..
115,000	10	,,	6	6/-	and Water { Pref. 6 p.c.	13½—14	9—9½	..
159,740	—	—	—	4%	{ 4 p.c. Deb.	..	67—69	..
992,045	Stk.	Feb. 26	14	14%	Brentford A Consolid.	261—266	76—79	..
784,220	,,	,,	11	11%	Do. B New	204—209	73—76	..
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	79—84	..
221,400	,,	June 11	4	4%	Do. 4 p.c. Deb.	91—93	63—65	..
217,380	,,	Feb. 26	11	9%	Brighton & Hove Orig.	208—213	140—145	..
244,300	,,	,,	8	6%	Do. A Ord. Stk.	154—159	95—100	..
530,000	20	Mar. 26	12½	22/6	British	44—45	31—32*	..
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	65—67	..
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	51—54	..
100,000	10	—	—	—	Cape Town & Dis., Ltd.	1½—2½	3½—3⅝	..
100,000	10	—	—	4½%	Do. 4½ p.c. Pref.	4—6	7—8	..
100,000	Stk.	June 26	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	58—63	..
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	79—81	..
1,513,280	,,	Feb. 12	5/9/4	41/4	Commercial 4 p.c. Stk.	106—108	67—69	67
560,000	,,	,,	5½	36/8	Do. 3½ p.c. do.	103—105	62—64	..
475,000	,,	June 11	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	52—54	..
800,000	,,	,,	4	—	Continental Union Ltd.	76—79	36—38	36
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	60—62	..
278,400	—	—	—	11¼%	Croydon B and C 7 p.c.	..	155—165	..
—	—	—	—	10%	Do. E	..	..	..
499,370	Stk.	—	6	5½%	Derby Con. Stk.	123—125	95—100	..
55,000	,,	—	4	4%	Do. Deb. Stk.	102—104	80—83	..
1,002,180	10	July 29	10	5/0	European, Ltd.	17½—18	7½—8½	7½
16,298,975	Stk.	Feb. 10	4/17/4	37/4	Gas { 4 p.c. Ord.	98—102	63—65	64—65
2,600,000	,,	,,	3½	3⅛%	Light { 3½ p.c. max.	76—79	55—57	..
4,062,235	,,	,,	4	4%	and { 4 p.c. Con. Pref.	96—99	68—70	68—69½
4,674,850	,,	June 11	3	3%	Coke { 3 p.c. Con. Ord.	72½—74½	55—57	..
130,000	,,	,,	10	10%	{ 10 p.c. Bonds	..	..	..
258,740	,,	Mar. 12	5	3⅛%	Hastings & St. L. 3½ p.c.	87—89	46—51	..
70,000	10	April 29	11	6%	Hongkong & China, Ltd.	16½—16⅝	7½—8½	..
86,600	—	—	—	9⅛%	Hornsey 7 p.c.	..	115—125	..
181,000	Stk.	Mar. 12	7½	7%	Ilford A and C.	151—154	90—95	..
65,780	,,	,,	6⅜	5⅛%	Do. B	115—118	70—75	..
65,500	,,	June 26	4	4%	Do. 4 p.c. Deb.	92—94	63—66	..
4,940,000	,,	May 14	9	4½%	Imperial Continental	150—160	84—86	84½—85½
1,235,000	,,	Feb. 12	3½	3⅛%	Do. 3½ p.c. Deb. Red.	84—86	65—67	..
235,242	,,	Mar. 12	6½	6½%	Lea Bridge Ord. 5 p.c.	119—121	82—87	..
2,498,905	,,	Feb. 26	10	5%	Liverpool 5 p.c. Ord. { A	211—213	82—84	..
					{ B	146—148		
306,088	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	71—73	..
75,000	5	June 11	6	2/-	Malta & Mediterranean	4½—4⅝	3⅝—3⅞	..
250,000	100	April 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	88—99*	88
541,920	20	May 28	4	6/-	Monte Video, Ltd.	11½—12	8—8½	..
1,875,892	Stk.	July 29	4½	3⅛%	Newcastle&Gatsh'd Con.	96½—99½	73—74	..
529,705	,,	June 26	3½	3⅛%	Do. 3½ p.c. Deb.	82—83	63—64	..
55,940	10	Feb. 26	7/14/0	7%	North Middlesex 7 p.c.	14—15	9½—10½	..
800,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—122	103—105	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7⅝	2—3	..
60,000	50	Feb. 26	13	10%	Portsea, Island B	128—131	82—87	..
100,000	50	,,	12	9%	Do. C	118—121	72—77	..
52,000	50	,,	10	7%	Do. D	..	..	..
249,980	5	April 29	8	—	Primitiva Ord.	5½—6	1⅜—1⅞	35/3—36/-
499,960	5	June 26	5	2/6	Do. 5 p.c. Pref.	4⅝—5	2⅜—2⅝	53/—56/-
521,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—98	76—78	77—77½
—	—	—	—	4%	Do. ,, ,, 1911	..	..	..
346,198	Stk.	June 26	4	4%	River Plate 4 p.c. Deb.	85—87	57—62	..
150,000	10	May 14	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	7½—7⅝*	7½
125,000	50	July 1	5	5%	{ 5 p.c. Deb.	47—49	40—42	..
135,000	Stk.	Mar. 12	10	10%	Sheffield A	223—224	..	..
209,984	,,	,,	10	10%	Do. B	222—224	174—177	..
523,500	,,	,,	10	10%	Do. C	220—222	..	..
90,000	10	May 28	9	6/-	South African	10½—11½	9—10	..
6,609,895	Stk.	Feb. 10	5/4/0	40/-	South Met. 4 p.c. Ord.	111—113	63—65	63½—64½
—	—	—	—	—	Do. Pref.	..	93—95	..
1,895,445	,,	July 10	3	3%	Do. 3 p.c. Deb.	72½—74½	54—56	..
224,820	,,	Feb. 26	8½	6%	South Shields Con. Stk.	157—159	134—136	..
962,795	,,	,,	6	4⅜%	S'th Suburb'n Ord. 5 p.c.	114—116	73—75	..
60,000	,,	,,	5	5%	Do. 5 p.c. Pref.	110—112	73—75	..
135,000	—	—	—	4½%	Do. West Kent	..	..	..
187,558	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116—118	84—86	..
647,740	,,	May 14	5	5%	Southampton Ord.	99—102	75—77	..
120,000	,,	Feb. 12	7½	5⅜%	Tottenham 'A 5 p.c.	135—138	90—95	..
782,275	,,	,,	6	4%	District { B 3½ p.c.	115—117	67—69	..
181,255	,,	June 26	4	4%	{ 4 p.c. Deb.	87—89	61—63	..
182,380	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	60—65	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max.	108½—109½	87—88	..
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	Feb. 26	8½	67/6	Wandsworth A 5 p.c.	151—156	108—113	..
255,536	,,	,,	6½	52/6	Do. B 3½ p.c.	129—134	80—85	..
108,075	,,	,,	5/17/3	47/3	Do. C 3½ p.c.	110—115	80—85	..
352,000	,,	,,	6½	46/3	Wimbledon 5 p.c.	117—122	80—85	..
98,000	,,	,,	6½	52/6	Epsom 5 p.c.	121—126	80—85	..
88,416	,,	June 26	3	3%	3 p.c. Deb. Stk.	66—69	49—52	..

* Ex Div.

Association of Great Britain and France (Industry and Economics).

There has been inaugurated an Association of Great Britain and France, which corresponds to its *confrère* "L'Association France-Grande-Bretagne" on the other side of the Channel—founded with a view to making better known, among friendly countries, the ideals, and specially the economic aims, of France, in order that true reciprocity, founded on mutual understanding, may be established. The Association is a complement to the industrial side of many excellent societies which are already in existence, or are being formed, with the object of binding us closer to our French Allies. Its work commenced in April last; and since that date the efforts of the Management Committee have naturally been directed to obtaining a strong nucleus of membership. It now counts among its supporters some of the most prominent firms and trade associations in the kingdom. It has been felt, however, that the time has come for the Association to have its own quarters and an independent organization, in order to further its aims. It has been resolved, therefore, to appeal to that wider public of both men and women whose sympathies or interests are affected by the industrial, commercial, or agricultural intercourse of the two countries. The subscription (two guineas) has been purposely kept low, and no entrance fee is charged. The President is the Rt. Hon. J. W. Lowther, M.P.; and the Vice-Presidents the Rt. Hon. Lord Moulton of Bank, P.C., K.C.B., and the Rt. Hon. Henry E. Duke, K.C., M.P. Among the Executive Committee are Sir Robert A. Hadfield, Bart., F.R.S., Mr. Henry Howard (Messrs. Stewarts and Lloyds, Ltd.), Sir William Pearce, M.P., Mr. R. C. Perry, C.B.E. (Messrs. Chance and Hunt, Ltd.), and Captain Riall Sankey, C.B. Full information regarding the Association, which it is to be hoped will attain a full measure of success, may be obtained on application to the Secretary, at No. 39, St. James's Street, London, S.W.1.

Increase in Price at Widnes.—A recommendation of the Gas Committee was agreed to at last week's meeting of the Widnes Town Council, raising the price of gas 3d. per 1000 c.ft. to ordinary meter users, and reducing from 44 to 39 c.ft. the quantity supplied for 1d. to prepayment meter consumers.

Doncaster Gas Supply Re-Established.—The Doncaster gas supply was re-established on Monday of last week, at about 10 a.m., after a month's break, owing to the recent municipal workers' strike. It took a week to get matters going after the men returned. Several retorts had cracked, and a good deal of repair work was necessary.

Theft of Coal from a Gas Company's Barge.—At the Tower Police Court last Saturday week, before Mr. Gill, Samuel Street (66), lighterman, and Herbert Cripps (28), mate of a sailing barge, were charged with stealing 1 cwt. of coal, the property of the South Metropolitan Gas Company. Inspector Avres, in giving evidence, said he saw the prisoners, in a boat, go to the barge "Joe," which was lying at Bankside, at 5.10 a.m., and remove some coal. Witness followed and stopped them, and found in the boat about 1 cwt. of coal. The prisoners, who said there was no coal on the barge on which they were working, and that they wanted a fire, were each fined 20s.

Nottingham Gas-Workers' Wages.—Members of the Nottingham and district branches of the General Workers' Union, embracing practically the whole of the gas employees, will benefit to the number of about 1400 by the latest award of the Committee of Production. There has been much elation manifested by the men at the terms of the decision, which ensures an increase in the case of stokers of 10s. a week on present rates, while in the lower grades 9s. a week will be added to the pay, meaning that on pre-war rates gas workers have received increases of from 22s. to 25s. weekly. By consumers the ultimate effect is not likely to be regarded in so complacent a light.

Dublin Gas Workers.—Mr. James Andrews, K.C., as Arbitrator, took evidence last week in regard to the claim of the Alliance and Dublin Consumers' Gas Company's workers for an increase of £1 a week on pre-war wages rates. The result will be duly announced.

Limavady Gas-Works Closed.—In accordance with the decision of the Limavady (co. Londonderry) Urban District Council, the gas-works were closed last week for the period up to September; and the townspeople who relied upon gas as an illuminant have had to resort to rather primitive means of lighting. The Irish Local Government Board have intimated to memorialists on the subject that the matter of closing-down the works was one for the Council to determine, and did not call for their interference. It was, they added, a curtailment due to wartime restrictions. A considerable number of ratepayers, indignant at the action of the Council, have threatened to combine for a public electric lighting installation.

Loughborough Slot-Meter Charges.—There having been considerable criticism lately of the charges made at Loughborough to slot-meter customers, Mr. W. F. Charles (Chairman of the Gas Committee) explained at a meeting of the Council that originally the cost of the meters and installation was included, and a charge of 10d. per 1000 c.ft. return was made in lieu of rent. Upon two occasions, the price of gas was dropped 2d. per 1000 c.ft. to ordinary consumers; this being returned to the slot consumers in the shape of discount. When the price of gas went up 6d., it was impossible to raise it to slot-meter consumers, who received no discount, but were, of course, 2d. to the good in comparison with ordinary consumers. To remedy this, instead of giving 20 c.ft. for 1d., the meters had been altered to 18 c.ft. The result was that the extra cost to slot consumers worked out at 1s. 1½d. per 1000 c.ft., and not 1s. 3d., or 3½d. over the previous 10d. The installation cost £6 3s. now, instead of £3 15s.; while the cost of collection had also increased. Slot-meter customers had nothing to complain of, especially when it was borne in mind that the cost of the meters and repairs was 50 p.ct. more than for ordinary meters.

The Under-Secretary for Ireland has notified to the Limerick Corporation his assent to the payment of £99 superannuation allowance to Mr. Henry Hawkins, late Gas Manager.

A report of the Manchester Corporation Gas Committee recommended, with regard to the supply of gas for motor traction, the increase of the price from 4d. to 6d. per 100 c.ft., when supplied from public filling-stations. The proposal has been adopted.

The suggestion has been made by a member of the Glasgow Corporation that, in view of the great difficulty and expense of firing the boilers with breeze, the Baths and Washhouses Committee should consider and report on the feasibility of using gas for this purpose.

Dealing with the financial position, at a meeting of the Driffield Urban District Council, Mr. S. H. Gibson (the Chairman of the Gas Committee) stated that during the past half year, for the first time since they were acquired by the Council, the works had been practically self-supporting.

A verdict of "Suicide while temporarily insane" was returned at Bradford, last week, in the case of Rose Moore, a soldier's wife, who was found dead on a bed, with a flexible pipe, one end having apparently fallen from her mouth and the other being attached to the gas-jet, which was turned on.

At the annual meeting of the Associated Chambers of Commerce held last week, a motion was passed urging the Government to pass into law the Decimal Coinage Bill prepared by the Executive Council of the Associated Chambers of Commerce in conjunction with the Institute of Bankers and the Decimal Association. It is understood that Lord Southwark will introduce the Bill into Parliament at the earliest possible moment.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

Engineer. Sheffield Gas Company. Applications by April 18.

Superintendent. Liverpool Gas Company. Applications by April 23.

Assistant Engineer and Works Superintendent. Oxford Gas Light and Coke Company.

Assistant Chemist (Tar-Works). No. 6436.

Shift Foreman. No. 6440.

Retort Setters and Bricklayers. Portsea Island Gas Company.

Bricklayers. Sheffield Gas Company.

Plant, &c., Wanted.

Steel Main (24 in.). Redditch Gas-Works.

Gasholder and Tank. Chertsey Gas-Works.

Plant, &c. (Second-Hand), for Sale.

Retorts, Meter, Coke Breaker, Screwing Machine, &c. Newton-in-Makerfield Gas Department.

Cast-Iron Connections. Cowdenbeath Gas-Works.

Compressors, &c. Thomas Johnson, Wigan.

Sale of Stocks and Shares.

Various Gas and Water Companies. Mart, E.C. April 30. Two o'clock.

Meeting.

Imperial Continental Gas Association. Cannon Street Hotel, E.C. May 7. 2.30 o'clock.

TENDERS FOR

Coal.

Carlisle Gas Committee. Tenders by April 30.

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COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders to Alter or stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Saturday.

Wanted, For Sale, and Tender Advertisements, Six Lines and under 3s.; each additional Line, 6d.

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Telegrams: "Patent London." 'Phone: 243 Holborn.
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THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement, Feb. 19, p. 371.

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GAS-WORKS requiring Extensions should Communicate with FIRTH BLAKELEY, SONS, AND CO., LIMITED, Dewsbury, who make a Speciality of Catering for the Smaller Gas Concerns. Prices Reasonable; quality and results, the best. Satisfaction Guaranteed.

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Applicants must have a thorough knowledge of Carbonization, and also Purification and Distribution of Gas, must be able to Prepare Plans for and Construct New Works, and also understand the Distillation of Tar, the Making of Sulphuric Acid and Sulphate of Ammonia, and the Erection of Plant in connection therewith.

The successful Candidate will be required to Devote the Whole of his Time to the duties of the office.

Commencing Salary, £1000 per Annum.

Applications, marked "Engineer," stating Qualifications, Age, and whether Married or Single, to be Delivered not later than Thursday, April 18, 1918, addressed to Mr. Hanbury Thomas, Managing Director.

Testimonials not to be sent in the first instance nor until asked for.

By order,
WM. HAMBY,
Secretary.

Gas Offices,
Commercial Street, Sheffield,
March 28, 1918.

LIVERPOOL GAS COMPANY.

APPLICATIONS are invited for the Position of SUPERINTENDENT of the Linacre Gas-Works. The Make of Gas per Day is about 18 Million Cubic Feet.

Candidates must be Ineligible for Military Service and have had considerable Practical Experience in Modern Methods of Carbonization, Carburetted Water-Gas Manufacture, the Control of Workmen, and the Care of Machinery and Plant on a fairly large scale. A Good Knowledge of Chemistry is also desirable.

Salary, £500 per Annum, with free use of Good House adjoining the Works.

Applications, stating Age, whether Married or Single, and full Particulars of Training and Experience, are to be addressed to the Chairman of the Company, and sent in not later than Tuesday, April 23, 1918.

RALPH E. GIBSON,
Engineer.

Duke Street,
Liverpool,
April 3, 1918.

WANTED — Assistant Chemist for Tar Works Laboratory in Metropolitan Area. Apply, by letter, to No. 6436, care of Mr. KING, 11 Bolt Court, FLEET STREET, E.C. 4.

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